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THE LONDON NATURALIST

Journal of the
LONDON NATURAL HISTORY SOCIETY

No. 89 2010

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LONDON NATURAL HISTORY SOCIETY

The Society welcomes new members, both beginners and experts. Its recording area (the London Area) lies within a 20-mile (32-km) radius of St Paul's Cathedral and here most of its activities take place. Although much covered with bricks and mortar, it is an exciting region with an astonishing variety of flora and fauna. The Society is open to those interested in arachnology, archaeology, botany, conchology, conservation, ecology, entomology, geology, herpetology, mammalogy, ornithology, palaeontology, rambling, and all other aspects of natural history. The Society comprises various sections, but all meetings are open to members without formality.

Publications

The London Naturalist, published annually, contains papers on the natural history and archaeology of the London Area and beyond, including records of plants and animals.

The *London Bird Report,* also published annually, contains the bird records for the London Area for each year, as well as papers on various aspects of ornithology.

Bulletins of news items, including the Society's *Newsletter* and *Ornithological Bulletin,* are sent to members throughout the year.

Indoor meetings

These are held in most weeks throughout the year, with lectures, discussions, colour slides and films on all aspects of natural history.

Field meetings

Led by experts to visit interesting localities, both within and outside our Area. These excursions are very popular with beginners wishing to increase their knowledge, and enable members to get to know one another.

Library

A large selection of books and journals on most aspects of natural history is available for loan or consultation by members free of charge.

Reading circles

Many important natural history journals are circulated by the Sections at a fraction of the cost of subscribing direct.

SUBSCRIPTIONS

ORDINARY MEMBERS	£20.00
STUDENT MEMBERS	£5.00
SENIOR MEMBERS	£16.00
FAMILY MEMBERS	£4.00
CORPORATE SUBSCRIBERS	£20.00

Student membership is for persons under 18 or receiving full-time education, and senior membership is for persons over 65 who have been continuous members of the Society for ten complete years. All except family members receive one free copy of *The London Naturalist* and the *London Bird Report* each year. Cheques and postal orders, payable to the London Natural History Society, should be addressed to

The Assistant Treasurer, LNHS,
Robin Blades,
32 Ashfield Road, London N14 7JY

THE LONDON NATURALIST

Further copies of this issue of *The London Naturalist* may be obtained (price £8 plus £1 postage and packing) from Catherine Schmitt, 4 Falkland Avenue, London N3 1QR. Back numbers of most recent issues of both *The London Naturalist* and *London Bird Report* are also available from the same address. Cheques should be made payable to the London Natural History Society.

Species-rich grassland on the Central Line, London Underground. See page 37.

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The London Naturalist, No. 89, 2010

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THE LONDON NATURALIST

Journal of the
LONDON NATURAL HISTORY SOCIETY

No. 89

for the year 2009

Edited by K. H. Hyatt

Readers are respectfully advised that the publication of material in this journal does not imply that the views and opinions expressed herein are shared by the editor, the London Natural History Society, or any party other than the named author or authors.

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LONDON NATURAL HISTORY SOCIETY

Founded 1858

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The Society's Recorders

Botany

Flowering plants and vascular cryptogams: Dr M. Spencer, 72 Michael Cliffe House, Skinner Street, London EC1R 0WX (020-7837 1471).

Fungi and lichens: Prof. E. G. D. Tuddenham, 17 Bedford Road, London N22 7AU (020-8374 5167).

Bryophytes: P. Howarth, 15 Stuart Lodge, Ashley Road, Epsom, Surrey KT18 5AP (07920 143431).

Ecology and Entomology

Mammals: C. Herbert, 67a Ridgeway Avenue, East Barnet, Hertfordshire EN4 8TL (armconservation@hotmail.com).

Reptiles and amphibians: T. E. S. Langton, B.SC., 12 Millfield Lane, London N6 6RA (t.langt@virgin.net).

Fishes: Vacant.

Arachnida: J. E. D. Milner, B.SC., 80 Weston Park, London N8 9TB (acacia@dial.pipex.com).

Coleoptera (Carabidae and Coccinellidae): P. R. Mabbott, B.SC., 49 Endowood Road, Sheffield S7 2LY (paulmabbott@blueyonder.co.uk).

Coleoptera (Lucanidae and Buprestidae): Dr D. S. Hackett, FRES, 3 Bryanstone Road, London N8 8TN (danielhackett@blueyonder.co.uk).

Coleoptera (families not otherwise listed): M. V. L. Barclay, 47 Tynemouth Street, London SW6 2QS (m.barclay@nhm.ac.uk).

Soil-dwelling invertebrates (Myriapoda, Isopoda, Diplura): Andy Keay, 37 Merrymeet, Woodmansterne, Surrey SM7 3HX (andykeay01@aol.com).

Lepidoptera (butterflies): L. R. Williams, 34 Christchurch Avenue, Kenton, Harrow, Middlesex HA3 8NJ (leslie.williams1597@btinternet.com).

Lepidoptera (moths), Syrphidae, and invertebrates not otherwise listed: C. W. Plant, B.SC., FRES, 14 West Road, Bishop's Stortford, Hertfordshire CM23 3QP (cpauk1@ntlworld.com).

Orthoptera: Sarah Barnes, 33 Tavern Close, Carshalton, Surrey SM5 1JE (lnhs.orthoptera@virginmedia.com).

Hymenoptera Aculeata: R. W. J. Uffen, 4 Mardley Avenue, Welwyn, Hertfordshire AL6 0UD (01438 714968, ruffen@talktalk.net).

Hemiptera: T. Bantock, 101 Crouch Hill, London N8 9RD (tristanba@ googlemail.com).

Odonata: Neil Anderson, B.SC., 52 Beechwood Avenue, Greenford, Middlesex UB6 9UB (neil@anders42.freeserve.co.uk).

Plant galls: Vacant.

Mollusca: Vacant.

Records may be sent to the appropriate recorder (where shown) or to Colin Plant who will distribute to each recorder the relevant data from a mixed set of records.

Geology

Vacant.

Ornithology

Inner London: R. Bonser, Flat 7, 96 Rope Street, London SE16 7TQ (richbonser8181@hotmail.com).

Hertfordshire: Joan Thompson, 73 Raglan Gardens, Watford, Hertfordshire WD19 4LJ (lnhshertsrecorder@jksthompson.plus.com).

Buckinghamshire: A. V. Moon, 46 Highfield Way, Rickmansworth, Hertfordshire WD3 2PR (andrew.moon@talk21.com).

Kent and Lower Thames (London Bridge to Tilbury): J. Archer, 8 Smead Way, London SE13 7GE (john_archer@gofast.co.uk).

Surrey and Upper Thames (London Bridge to Staines): N. Tanner, 11 Collins House, Newby Place, London E14 0AX (nick_tanner@talk21.com).

Middlesex: M. Pearson, 48a Stamford Hill, London N16 6XT (middxrecorder@googlemail.com).

Essex: R. Woodward, 62c High Street, Cheshunt, Hertfordshire EN8 0AH (roy.rkwoodward@ntlworld.com).

Requests for information should be made to the appropriate recorder.

Contents

Species-rich grassland on the Central Line, London Underground *Frontispiece*

Officers for 2010 3

The Society's Recorders 4

Report of the Society for the year ending 30 June 2009 6

Official and sectional reports for 2009 11

EDGINGTON, JOHN — The fern flora of inner London 19

SWINDELLS, JOHN — London Natural History Society's 150th Anniversary Walk: London Fields to The Barbican, Tuesday 17 June 2008 31

JACKMAN, SUZIE — Wildlife and habitats over ground on the London Underground 37

MCLAUCHLIN, JANE — Monitoring the recolonization of cleared ground at Oxted Downs, Surrey 47

EDGINGTON, JOHN — Bur chervil reappears in Green Park 59

MILNER, J. EDWARD — Spider records in 2008 and 2009 for the London Area; and concern about a misleading article in the national press 61

WILLIAMS, L. R. — London butterfly monitoring report for 2009 65

ANDERSON, NEIL — Odonata report for 2009 77

Survey of Bookham Common: sixty-eighth year Progress report for 2009 79

MILNER, J. EDWARD — Orb-web spiders on the Ladies Bathing Pool Meadow and elsewhere on Hampstead Heath 93

DUCKETT, JEFFREY G. and PRESSEL, SILVIA — London's changing bryophyte flora 101

SPENCER, MARK — Botany report for 2008 and 2009 117

Book reviews index 141

Report of the Society for the year ending 30 June 2009

Approved at the Annual General Meeting on 16 December 2009

Objectives

The objects of the Society are the study and recording of natural history, archaeology and other kindred subjects, especially within twenty miles of St Paul's Cathedral, the promotion of scientific investigations, the appreciation and conservation of the natural environment and the publication in the Society's journals of scientific and educational papers. Activities and achievements in respect of these objectives are described below.

Governance: Council, Committees and Sections

The Society is governed by a Council of Trustees, comprising the officers (president, treasurer, secretary), ten representatives of the members at large and one representative of each of the Society's Sections (currently five). Sarah Graham-Brown joined the Council as a representative of the members at large, while Marc Carlton and Pippa Hyde resigned as Trustees. Catherine Schmitt (Ecology and Entomology Section) was replaced by David Howdon, and Stuart Cole took over from Ian Swinney as representative for the Bookham Common Survey. The remaining Trustees were re-elected. Rule 4(c), limiting a continuous period of elected membership to five years, came into force in December 2005 and will first be implemented at the AGM in 2010. The Administration and Finance Committee, chaired by Colin Bowlt, deals with much delegated business.

Council appointed David Bevan an honorary vice-president of the Society in recognition of his services to botany, conservation and public appreciation of wildlife, particularly among young people. David continues to serve on the Management Board of the London Biodiversity Partnership, having successfully resisted an ill-judged attempt to deny both the Society, and London Wildlife Trust, permanent membership of the Board. The Society offers the Partnership, otherwise largely consisting of statutory bodies with limited knowledge of the natural environment in which they operate, an independent source of information and advice.

On the recommendation of its chairman, David Lindo, and with the agreement of Council, the Committee of Ornithology Section decided to change the Section's name to 'The London Bird Club – part of the London Natural History Society'.

Membership

One hundred and fifteen new members joined during the year, up from 104 last year. The number of individual members currently stands at 1,003, compared with 968 at the same time last year, and 942 the previous year. Two factors, active recruitment at events such as the Lee Valley Spring Wildlife Weekend, and the Society's attractive and informative website, probably account for this welcome rise following several years of decline. The Society is not just for experts — field meetings are planned with beginners in mind, and newcomers are encouraged to play an active part in the Society's affairs. Towards the end of the year, the Society was successful in securing funding from the Open Air Laboratory project (OPAL) to run a series of weekend events for family audiences, intended to enhance their knowledge of urban wildlife and to encourage a younger membership. There will be a fuller report on this project next year.

We record with regret the deaths of the following members during the year to 30 June (date of joining in brackets): Miss Maureen Currie (1960), Mrs Pamela Goldsmith (1967), Mrs Edna Greenwood (1966), Mr Hugh Jones (1988), Mr W.G. (Bunny) Teagle (1945), Mr Cyril Walker (1956), Mrs Pamela Washer (1958), Sir Charles Willink (2000) and Miss Kay Wilson (1985). Miss Currie was chairman of the Ecology Section 1971–72, and later secretary of the Ecology and Entomology Section for many years. Obituaries of Bunny Teagle, Sir Charles Willink and Cyril Walker will appear in *The London Naturalist.*

Anniversary events

The Society traces its origins to the formation in 1858 of the Haggerstone Entomological Society, subsequently the City of London Natural History Society, which merged in 1914 with the North London Natural History Society to form the LNHS. Following the field meetings in Haggerston and elsewhere, mentioned in last year's report, the main event to mark the 150th anniversary was a conference, 'London's Natural History – past, present, and future' held at the Linnean Society on Saturday 11 October 2008. Organized jointly with our hosts and the Society for the History of Natural History, the conference was opened by Dr Helen Phillips, Chief Executive of Natural England. The hundred members and guests who attended heard seven absorbing and thought-provoking talks which will be published, together with Dr Phillips' opening address, in *The London Naturalist.*

A selection of classic papers from *The London Naturalist*, introduced by commentaries on their past and present relevance, was published as *London's Changing Natural History*, edited by our president Mark Burgess. A wall calendar for 2009, profusely illustrated by members' photographs, was produced for the Society with consummate skill by Mike Trier; it was well received and much in demand as a small Christmas gift. Also in December, members who attended the AGM were treated to a showing of the Society's film *London's Birds*, first shown in 1963. The commentary was provided by Pat Sellar who has transferred the original ciné-film to DVD.

Recording

The Records Policy, under which recorders should make their data available to the local records centre, Greenspace Information for Greater London (GiGL), was mentioned last year. Council is concerned that not all recorders have indicated their willingness to carry out this policy, which is clearly in the public interest and in line with our charitable objectives. John Swindells, the Society's representative on the GiGL Steering Group, is addressing the problem.

On the initiative of Mark Spencer, recorder for vascular plants, plans are advancing for a new *Flora* of Greater London to replace Rodney Burton's *Flora of the London Area*. These were outlined, to great enthusiasm, at meetings which attracted visitors and recorders from neighbouring Watsonian vice-counties, as well as LNHS members. It is now necessary to translate this enthusiasm into 'square bashing' by the many volunteer recorders needed to carry out this project over the next few years.

Entomology appointments include Tristan Bantock as recorder for Hemiptera (true bugs) and Andy Keay as recorder for soil-dwelling invertebrates (Diplura, Isopoda and Myriapoda). Amanda Waterfield resigned as recorder for lichens, while all but one of the bird recorders, who have geographical responsibilities, have changed: Richard Bonser takes over Inner London from Des McKenzie; Joan Thompson replaces Adam Wilson in Hertfordshire; in Kent and Lower Thames, John Archer succeeds Steve Spooner who moves up-river to Surrey and Upper Thames in place of John Horton; finally, Christopher Langsdon gives way to Roy Woodward in Essex while Mark Pearson replaces Rob Innes in Middlesex.

A problem currently exercising Council is how to make card files containing some 800,000 historic bird records from 1900 to 1987 accessible for data mining and scientific study. A likely solution is to scan the cards manually and store the electronic images for subsequent indexing and digitizing.

Journals and other publications

The London Naturalist **87** (2008) was published in December 2008, *London Bird Report* **70** (2005) in October 2008, and **71** (2006) in May 2009 (though printing delays meant that it did not reach members until September). Thus, Council's requirement that both these *LBR*s appear by April 2009 was largely met. The Ornithology Committee considered the future of the *LBR* and the *Ornithological Bulletin* in light of the survey of members' opinions mentioned last year, and recommended that the former continue to be published in its present format, with changes to speed its production and increase its interest to members and the general public, but that the *Bulletin* be discontinued. Council will consider these recommendations in the wider context of communicating to members via the *Newsletter* and the website. Emma Hinton resigned as *Newsletter* editor due to other commitments, and was replaced by Nick Bertrand.

Library

A few days after the end of the period covered by this report came the welcome news that the Society's library, held in storage at the Natural History Museum, would soon be accessible once more to members and the public. Thanks to the efforts of Library Committee secretary David Allen and our librarian Linda Hewitt, all the books and some of the journals, including those published by the LNHS, are now shelved in the Angela Marmont Centre for UK Biodiversity at the NHM's Darwin Centre Phase 2 which was opened by Prince William in September. The Society will retain ownership. Detailed arrangements for access, both to the open shelves and the remainder of the collection, are yet to be agreed, but it is a pleasure to record that the Society's assets are again being used for the public benefit.

Grants in support of the Society's objectives

Last year a grant of £1,000 was made to the Hertfordshire Natural History Society to assist publication of *The moths of Hertfordshire*. A similar sum has been awarded to HNHS this year to support publication of *Flora of Hertfordshire* by Trevor James. As a considerable portion of the county lies within our Society's recording area, these publications are of mutual benefit.

Conservation of the natural environment

Rich habitats are still under threat from developers, though these are currently less active in the depressed economic climate. The Society is often asked to lend its voice to protests against such developments. Council's view is that an appropriate campaigning body in such cases is the London Wildlife Trust, the Society being willing to provide evidence-based advice if required. Proposals that would affect Rotherhithe Ecology Park, and East India Dock Basin, fall under this category. One threat that has been lifted is the London Gateway Bridge from Thamesmead to Barking that would have destroyed good examples of saltmarsh and mature brownfield habitats on both banks; the proposal was withdrawn by the Mayor in July 2009. The full effects of the Olympic Park on the plants, birds, insects and fish of east London remain to be seen — they are likely to be dire. London has seen great changes before and no doubt will again. Our Society, we hope, will still be recording them 150 years hence.

This report has been prepared with due regard to the Charity Commission's guidance on public benefit.

Treasurer's report for 2008/2009

At the end of the financial year on 30 June 2009, the total net assets of the Society were £337,181 compared with £339,334 the previous year.

The accounts for the year show a deficit of £2,153 compared with a surplus of £6,671 in 2007/2008. Income totalled £42,654 compared with £40,670 in the previous year. However, this headline figure masks the fact that income from the Society's investment in the COIF Charities Deposit Fund fell to £11,155 (from £18,094 in 2007/2008), due to the reduction in interest rates in the period. Fortunately the shortfall was almost exactly matched by the unexpected receipt of bequests, but this cannot be relied upon in future and, as interest rates have subsequently fallen further, the Society will have to consider possible cost-saving measures.

Overall expenditure during the year was £44,807 compared with £33,999 in the previous year, with the greater part of the increase being due to production and mailing of publications and other expenditure commemorating the Society's 150th anniversary, including the Conference.

Reserves policy

The Society's unrestricted general funds can be regarded as expendable endowment since they are invested to provide a regular source of income as well as capital growth, over time.

Statement of trustees' responsibilities

Law applicable to charities in England and Wales requires the trustees to prepare financial statements for each financial year which give a true and fair view of the charity's financial activities during the year and of its financial position at the end of the year. In preparing those financial statements the trustees are required:

- to select suitable accounting policies and then apply them consistently
- to make judgements and estimates that are reasonable and prudent
- to state whether applicable accounting standards and statements of recommended practice have been followed subject to any departures disclosed and explained in the financial statements; and
- to prepare the financial statements on the going concern basis unless it is inappropriate to presume that the charity will continue to operate.

The trustees are responsible for keeping accounting records which disclose with reasonable accuracy at any time the financial position of the charity and enable them to ensure that the financial statements comply with the Charities Act 1993. They are also responsible for safeguarding the assets of the charity and hence for taking reasonable steps for the prevention and detection of fraud or other irregularities.

Accounts follow:

Summarized accounts for the year ended 30 June 2009

These summarized accounts have been extracted from the Society's annual accounts for 2008/2009. They may not contain sufficient information to provide a full understanding of the financial affairs of the Society. For further information on the full accounts, the Independent Examination report on these accounts and the trustees' annual report should be consulted. Copies can be obtained from the Hon. Treasurer, M. J. West, 52 Trinity Road, Ware, Hertfordshire SG12 7DD.

The full annual accounts were approved by the trustees on 14 October 2009.

Summarized statement of financial activities for the year ended 30 June 2009

	Unrestricted general funds	
	2009	2008
	£	£
Incoming resources		
Incoming resources from generated funds:		
Voluntary income:		
Subscriptions received from members	**20,680**	20,445
Donations and legacy income	**7,516**	562
Investment income:		
Interest receivable	**11,401**	18,751
Incoming resources from charitable activities:		
Publications/journals/Conference income	**3,057**	912
Total incoming resources	**42,654**	40,670
Resources expended:		
Charitable activities	**41,219**	30,255
Grants payable	**1,000**	1,000
Governance costs	**2,588**	2,744
Total resources expended	**44,807**	33,999
Net movement in funds	**(2,153)**	6,671
Fund balance brought forward at 1 July	**339,334**	332,663
Fund balance carried forward at 30 June	**£337,181**	£339,334

Balance sheet as at 30 June 2009

	2009	2008
	£	£
Fixed assets		
Tangible fixed assets	**146**	325
Net current assets (including cash deposits)	**337,035**	339,009
Total net assets	**£337,181**	£339,334

Official and sectional reports for 2009

CONSERVATION

The London Biodiversity Partnership (LBP), of which our Society has always been an active partner, had another busy year. In tune with other Biodiversity Partnerships in England and with advice from Natural England, a new landscape-scale approach to nature conservation has been adopted. Following three lengthy workshops led by the Partnership, at which the suitability of a range of London landscapes was assessed, a final decision was reached in favour of the River Thames and its tributaries. This is now known (bureaucratically) as the Integrated Biodiversity Delivery Area (IBDA) for London. It will be one of approximately thirty such landscape-scale areas across England that are intended to lie at the heart of the England Biodiversity Strategy. Now extended to include north Kent, south Essex and bits of Hertfordshire, the London IBDA will be used to work with existing and new partners for the enhancement of biodiversity, facilitating climate change adaptation, and promoting green infrastructure.

The Partnership supported two contrasting surveys of scarce London species. The first was a detailed survey of London's dwindling population of adders *Vipera berus*. This work was carried out by the London, Essex and Hertfordshire Amphibian and Reptile Trust (LEHART), under the capable direction of Will Atkins. The project included habitat enhancement work at the few sites where adders remain.

The second survey, undertaken this time by the Natural History Museum, investigated the possible survival of dwarf milkwort *Polygala amerella* in the London area. This is a very rare species of grazed chalk grassland. Fred Rumsey carried out the work and, although no trace of the milkwort could be found in its few previously known London locations, the survey did identify a site in Bromley where a reintroduction project might have some chance of success.

Froglife continued as an active member of the Partnership and, supported by members of the Standing Water Habitat Action Plan (HAP), created a number of new ponds in several London boroughs during the year. In addition, members of the Reedbed HAP reached a major milestone during the year, by creating more than ten hectares of reedbed, thus exceeding the 2015 target.

GiGL, a pivotal member of the Partnership, has continued to support the London boroughs in a variety of ways. As a guide for future habitat creation, enhancement and restoration, GiGL prepared 'habitat opportunity' maps for each borough, showing sites where such projects might best be undertaken. The London boroughs are also able to make use of GiGL's expanding work as a biological records centre. The LNHS continued to support GiGL by providing valuable biological data through our many recorders. This provision of data is one of our Society's most valuable contributions to the Partnership, and it is greatly regretted that one or two individual recorders still remain reluctant to provide details of their records to GiGL.

Amanda MacLean, LBP's hard-working part-time Local Biodiversity Action Plan (LBAP) officer, continued to work closely with the boroughs in assisting them in developing their BAPs and ensuring that regional habitat targets are incorporated within the Boroughs' Local Development Frameworks.

Although the Capital Woodlands Project finished at the end of 2008, much of the work that it initiated has continued in 2009 and is now overseen by individual London boroughs. In Queen's Wood in Haringey, for example, the local Friends group (funded by the SITA Trust) cut an extensive coppice in February. Changes to the vegetation are being monitored by the Conservation Officer and, as in Coldfall Wood (discussed in previous Conservation reports), a number of scarce and declining London plants have appeared. They included slender St John's-wort *Hypericum pulchrum,* square-stemmed St John's-wort *H. tetrapterum* and heath groundsel *Senecio sylvaticus.* These species are thought to have lain dormant in the seed-bank for many years. By the end of 2009, the coppice had 'recruited' an additional 105 species not seen in the same area in 2008. An account of this work, and a detailed flora of Queen's Wood was presented by the Conservation Officer at the Annual Exhibition of the Botanical Society of the British Isles in November.

DAVID BEVAN, *Conservation Officer*

BOTANY

At the AGM in November 2009 Mark Spencer gave us an exciting preview of plans for a new *Flora of London.* He opened by asking the question: 'Why do we need another *Flora*?' Rodney Burton's *Flora* is still important and useful, but since the 1960s and 1970s many changes have occurred, some of them massive. Water bent for example, previously little seen, is now abundant, while the tree of heaven, which was referred to in Rodney's *Flora* as occasional, is now abundant and widespread. London is a different place from what it was then. The 'heat island effect' has become more pronounced, and the city has now become a biological 'island' distinct from surrounding counties. The new *Flora* will need to look carefully at inner-city streets as well as the more rural parts of London. It will provide invaluable data at a time of rapid change.

With the agreement of Council, the Botany Committee is now acting as the steering committee for the project. Much work still needs to be done. There are many historical records that need to be 'mined', including those of Duggie Kent's *The historical flora of Middlesex,* the GLA Habitat Survey, and GiGL's extensive datasets.

The coverage of the *Flora* is also a matter for debate — whether it should cover the whole of the LNHS polygon, or stay within the GLA boundaries. Mark expressed a strong personal preference for the latter. Most of the adjoining vice-counties are in the process of internal data gathering themselves. If the London *Flora* moved out to these areas, it would duplicate effort and the Society might not have the capacity and resources to cover the whole polygon.

The *Flora* is an ambitious undertaking. Meetings in 2009 set up three core working groups. The first will look at historical data (including the Natural History Museum's herbarium, which has just acquired the London records of nineteenth-century naturalist Jon Stephenson). The second will focus on fieldwork. Part of their remit will be to develop training sessions aimed at getting more people involved — and able to recognize, for example, the 200 most-common plants. Finally, there will be a data collection and management group. Mark noted the importance of trying to streamline formats into one or two that work. Matt Davis and Mandy Rudd at GiGL are very interested in the technical aspects of data management.

Mark concluded by emphasizing that the current pace of ecological change will not allow us to hold the *Flora* up to achieve perfection. If it takes 20–25 years to complete, it will lose its relevance. We need a tight recording period of 7–8 years with two years to write up.

Mark's talk was followed by a lively discussion that further addressed some of the complex issues that face the Committee in organizing the *Flora.* The *Flora* will be based on 1-km squares, and volunteers were sought to act as field coordinators for each 10-km square. It was emphasized that these coordinators will need to make an analysis of recording effort and encourage people to fill gaps that are identified. Access is also an issue. It was generally agreed that gardens would not be included. Recorders would only survey in public spaces and in areas where permission had been granted by landowners (such as British Waterways or London Underground).

Indoor meetings began in January with the annual 'Best Botanical Photos' session, which gave members a chance to display their best photos of the previous year. During the summer Mark Spencer again ran a successful session on 'Botany for Beginners', and there were identification sessions on difficult groups of plants: on *Rumex* and *Epilobium*, guided by Geoffrey Kitchener, and on *Conyza* and other Asteraceae by Mark Spencer. In September we heard Dr Robyn Cowan explain the intricacies of efforts to develop DNA barcoding for plants.

The usual extensive programme of field meetings was organized by George Hounsome, our field meetings secretary. The 2009 season began in February when Mark Spencer led us on a stimulating visit to urban sites in the Farringdon area; and there was a return visit to Lesnes Abbey Woods. In the spring, we visited the Ashdown Forest and David Bevan's wild cottage garden. Ted Tuddenham led a fungus foray in Trent Park, and Pat Verrall took us to St Martha's Hill in Surrey. There was an evening visit in May to Queen's Wood in Highgate for a first look at the newly coppiced area. George Hounsome led a joint recording meeting with the Surrey Botanical Society at Frillinghurst Wood. Two further meetings were held in the spring and summer at London Zoo, part of an ongoing series to record the Zoo's flora.

The early summer saw visits to Canvey Island, Tripcock Ness and Mitcham Common. In July and August there were trips to Merrow Downs, Horsenden Hill and Amberley Wild Brooks, and in September to Chobham Common and the London Wetland Centre. As in recent years, there were some regular favourites focusing on the flora of inner city areas: John Swindells' 'Pot luck in the East End' and Nick Bertrand's 'Dome to Deptford', following the Thames path in Greenwich, and 'Strictly Street Life' in Lambeth.'.

The Flora of London

Mark Spencer and the LNHS Botany Committee have taken the first steps to develop plans for a new *Flora of London* (see above). No formal recording was carried out during 2009 while the role of coordinators for the project was being clarified and work was carried out on developing a bespoke recording card for the GLA area. In 2010 it is planned to focus a number of field meetings on recording for the new *Flora*. If you would like to participate in work on the new *Flora*, please contact Mark (72 Michael Cliffe House, Skinner Street, London, EC1R 0WX; Tel.: [+44] 020 7837 1471; E-mail: Lnhs_plant_recorder@hotmail.co.uk).

The botanical collections at the Natural History Museum have now been moved to the new Darwin Centre, which will also provide long-awaited access to the LNHS library in the Angela Marmont Centre for UK Biodiversity.

Recorders' reports

Dr Mark Spencer reported that the majority of his activity as vascular plant recorder during the year was concentrated on the *Flora of London* project. In addition to the LNHS meetings he led, including the walks at Tripcock Ness and Horsendon Hill, he contributed to the LBP reedbed HAP (specifically relating to *Sonchus palustris*), and Islington BAP. He has responded to various non-commercial enquiries relating to identification and records data. During the year, he received over 35,000 records — a huge increase from 2008 — which is mainly due to the efforts of one contributor.

Amanda Waterfield has decided to resign as recorder of lichens after ten years in the post. We are very grateful to her for providing the Society with her great expertise over this long period. Fortunately, Ted Tuddenham has agreed to take over from her, so that from 2010 he becomes recorder of fungi and lichens. Amanda's last recorder's report for 2009 is summarized below:

'2009 is my final year as the official LNHS recorder. I fear with fading eyesight and lack of computer skills, it is time to hand over to someone younger. Ted Tuddenham offered to take it on, which I was very pleased about because lichens are fungi. To say fungi and lichens is like saying animals and birds. Appropriately I have been working with Alick Henrici, the fungal recorder at Kew (where he has recorded over 2,500 fungi), on lichen records. The result will be published in *The London Naturalist*.

'Recording in Dulwich Park was interesting, as *Lecanora carpinea*, with pruinose fruits, seems to be taking over from *L. chlarotera*. Is this a result of climate change? OPAL launched its Air Survey with a lichen pack in September, which can be downloaded from their website: www.opalexplorenature.org/. This is a nationwide project, which it is hoped will generate enough information for some relevant statistical analysis. As 2010 is the International Year of Biodiversity, I hope everyone will go out and record what is around them.'

In her report on bryophytes, Dr Mary Clare Sheahan noted that it is encouraging to see that some species seem to be becoming more common, for example *Metzgeria furcata*, *Cryphaea heteromalla*, *Cirriphyllum piliferum*, and *Frullania dilatata*. *Dicranum scoparium* is also found more often on trees in the London area. This theme is developed in great detail by Professor Jeff Duckett in an extensive study of the changes that have recently taken place in the bryophyte flora of London (see his article published in *Field Bryology*, the newsletter of the British Bryological Society). His conclusions are of importance to anyone interested in the changing flora of London. Although many species of mosses and liverworts were lost during the twentieth century, there have been a number of pleasing come-backs — something which adds an extra interest to field visits. Another article by Jeff Duckett on an unusual occurrence of liverworts growing on the leaves of other plants also appeared in *Field Bryology*.

Bryologists all over the country are awaiting with interest the imminent publication of the *BBS Field Guide*. This has been available to view on the BBS website as it developed, so we already know how good the pictures are, and it should make field excursions even more informative. An updated Bryophyte Atlas is also planned, which will prove a focus for future recording meetings.

A bryophyte meeting for beginners was held in March on one of the regular Hampstead Heath Survey days. In addition there have been several informal recording visits to sites such as Stanmore Common, Harrow Weald Common and Whitewebbs Park near Enfield. Meanwhile, data entry continues, though somewhat slowly.

Professor Ted Tuddenham reports that the 2009 spring foray in Trent Park was not very species-rich, taking place in fairly dry conditions on 19 April. The twenty members assembled searched for the target species — as usual, St George's mushroom *Calocybe gambosa* — but of this there was not a sign until Keir Mottram found one in the cemetery adjacent to the Park. Other spring and late winter fungi were in evidence and a total of twenty taxa were found. June to August proved to be a wash-out instead of a barbecue summer but this did not seem to bring out many fungi. September was the driest on record, so no fungi to speak of were seen. Fortunately the grand annual foray was delayed until 1 November, by which time the rains had come in abundance. This was the twenty-fifth annual Haringey autumn foray starting at Railway Fields and roving the best sites in the borough. The tradition was started by Keith Thomas and he returned for this silver anniversary foray. Just under a hundred species were found on the main four sites including, as usual, species new to the borough and to the individual sites. The records of this foray and the previous twenty-five years have been accepted as a poster to be presented at the 9th International Mycological Congress in Edinburgh in August 2010.

DAVID BEVAN, *Chairman*, SARAH GRAHAM-BROWN, *Secretary*

ECOLOGY AND ENTOMOLOGY

The year has seen growth in the Section in the number of meetings, indoors and out, of committee members and of recorders.

Our indoor meetings secretary, Claudia Watts, has arranged speakers on topics of interest to members in general as well as to entomologists. In February, Alister Hayes spoke to us on 'Darwin at Downe' in the year we were celebrating Charles Darwin's 200th birthday and the 150th anniversary of the publication of *On the Origin of Species*. Representing Bromley Council in a bid to have the area around Down House named a World Heritage Site for its scientific interest, Alister made a cogent case for Darwin's researches around his home being a key element in his thinking and the eventual formulation of his theory of evolution.

In March, Chris Skinner, Community Project Officer told us of her work on 'The Old Surrey Downs Project: restoring the beauty of chalk grassland'. Historically this was sheep-rearing land when the wool trade made England rich, so grazing created the downland landscape. The logo of the Project shows people walking, a Jacob's sheep and a butterfly. This symbolizes the role of livestock and people in managing the chalk grassland for the benefit of butterflies and other wildlife. Where possible the Project is trying to join up the various pieces of land in their care to counteract the fragmentation of the historic landscape by urban development and by land taken for farming. One of the major causes of concern is the invasion of scrub due to lack of grazing which is where their use of livestock — horses, goats and Soay sheep — on some sites comes in. The aim of the Project is to restore and maintain this landscape for the enjoyment of all.

An overcast evening in June at Camley Street Natural Park was not ideal for the dragonfly identification workshop given by Steve Brooks (only caddis-flies were active) but Maria Roberts managed to net a damselfly larva when we dipped in the pond. This led to the lecture on the varied habits and habitats of different species of dragonflies and damselflies.

At the annual Brad Ashby Memorial Lecture, held jointly with the British Entomological and Natural History Society in September, Keith Alexander discussed 'Ancient and Veteran Trees: their very special wildlife and the conservation implications'. Trees that are several hundreds of years old with quantities of dead and decaying wood are very rare. Consequently so are the invertebrates that live in the rotting hearts, many of them Red Data Book species, including several species of beetle. Keith urged that these trees be mapped and protected.

In the past our AGM in November has consisted of reports from recorders leading to comment and discussion. This year we kept the meeting to formal business and you can read their reports elsewhere in this journal. Colin Bowlt as chairman and Freda Turtle, as a long-serving member of the committee, both stood down. We thank them both for their contributions in the past. Mick Massie was elected chairman and Tristan Bantock takes his place as field meetings secretary. During the year we also appointed Tristan as recorder of Hemiptera and Andy Keay as recorder of soil-dwelling invertebrates (Diplura, Isopoda and Myriapoda). At the meeting Sarah Barnes was elected as recorder of Orthoptera.

The AGM was followed by a Sectional meeting where Lucy Carter, Project Officer of the Open Air Laboratory (OPAL) Project told us of this programme to engage and interest the public in the environment and biodiversity. A Big Lottery Fund project, £11.7 million has been awarded over a five-year period to provide tools and training in nine regions in England with a lead scientist in each region. Linking fifteen academic institutions with the general public, using facilities ranging from a window box to a local park, this is an experiment in raising the profile and increasing the public's experience of natural history while adding to the data to be professionally analysed. LNHS hopes to be a contributing partner to another OPAL event. We are proposing four Saturday sessions in association with the Linnean Society to try to introduce teenagers to British wildlife.

Mick Massie organized a very busy and satisfying year of field trips, with a record twenty-six taking place, an average of one trip every other week throughout the year. They ranged from a freezing trip to the Heathrow area with Edward Milner for spiders, attended by half a dozen hardy souls, to the massed ranks of pilgrims attending Neil Anderson's trips to Greenford and Richmond. We had the benefit of sixteen different trip leaders through the year and our thanks go to all of them. Sadly, Robert Callf has stepped down as our butterfly spotter at Trent Park so we are looking for a new leader to cover that excellent location. Many thanks to Robert for his past efforts.

We bravely extended the autumn season right into November this year with eight trips and were well rewarded with good weather at some excellent sites. We had joint events with London, Essex & Herts. Amphibian & Reptile Trust (LEHART), Butterfly Conservation and the British Entomological and Natural History Society (BENHS), and will continue this policy for 2010 including National Insect Week in June.

We have started a gallery of field-trip photographs on Flickr so that the regular band of enthusiastic trippers can enjoy looking back at the highlights, and that other members can see what they are missing. In order to continue to support this large number of trips in the future, we have formed a small subcommittee to support the work of the field and indoor meetings secretaries.

Once again the Section represented the Society at the Amateur Entomologists' Society Exhibition, selling books and journals as well as making the work of the Society known to a wider public.

COLIN BOWLT, *Chairman,* CATHERINE SCHMITT, *Secretary*

ORNITHOLOGY — LONDON BIRD CLUB

The most momentous decision of 2009 was the proposal to change the name of the Ornithology Section to London Bird Club. This had been mooted for some time but this year the Committee decided to take action. It provoked some discussion among the Committee and on Council but the Committee decided that it was in the long-term interests of the Society to try to attract younger members. This name will give the Section a better image and be much easier to promote in the media. It will also be much easier to find information about birding in London on the Internet and our competitors are all easy to find there. We know that some long-standing members believe this is a retrograde step but we do believe it is essential for our long-term future.

As in previous years, Pete Lambert had organized a splendid series of walks round London in 2009. There was one almost every weekend and they covered the whole of London. He says: 'As usual, some of the trips produced exciting birds, the highlights being a Dartford warbler at Crossness and a garganey at Rainham. Otherwise, most of the more unusual birds were recorded on walks outside the LNHS recording area. These included over a hundred avocets at Two Tree Island in November, marsh harrier and spotted redshank at Wat Tyler Country Park in January (together with an unseasonal greenshank), a ringbilled gull and several Mediterranean gulls at Southend in February and singing woodlark at Chobham Common in May.

'However, the trips inside London also produced four species of owls and five species of raptor. Long-eared owls roosted at Beddington in January and in March, little owls at Tooting in January, a barn owl at Crossness in April and two juvenile tawny owls at Abney Park Cemetery in August. Buzzards were at Amwell, Trent Park, Beddington, and Wormwood Scrubs, peregrine at Wraysbury and Beddington, and hobby at Cheshunt, Beddington and Sewardstone.

'Other birds recorded which are now difficult to find in London included tree sparrows (recorded only at Beddington), marsh tit and red-legged partridge, both recorded only at Amwell, nightingale recorded only at Cheshunt, spotted flycatcher recorded only at Wormwood Scrubs, lesser spotted woodpecker recorded only at Trent Park and Tooting, and yellow wagtail recorded only at Crossness. For those with a taste for "odd" wildfowl, there were red-crested pochard at Amwell, and a bar-headed goose at Forty Hall.

'A new feature introduced this year was a Tour of London in which I will take people to sites we do not normally visit. So far we have visited South Norwood Country Park and Hornchurch Country Park. Any suggestions for places to visit are always welcome, as are new faces on the walks.'

Neil Anderson organizes the coach trips. He reports that: 'January was chosen for our visit for Titchwell when we saw plenty of waders and wildfowl as well as snow buntings along the beach. A trip to Rye Harbour in mid April was not well supported but there was much to see, with over fifty Mediterranean gulls a real highlight as they bred amongst the black-headed gulls. Our trip to Minsmere in early May was well supported where we encountered booming bitterns, "pinging" bearded tits, marsh harriers and marsh tits. Equally popular was the outing to Cley in late August where we had prolonged close views of bearded tits as well as seeing a good variety of waders and an eclipse garganey. Sadly the end of the year proved rather disastrous with our late November trip to Pagham Harbour cancelled due to few subscribers.

'For totally different reasons, a fully booked outing for our first visit to Hickling Broad to see the cranes and the raptor roost was also cancelled, owing to severe weather warnings that may have compromised the safety of members.'

Judy Cobbett reports on the Ornithology Indoor Meetings. 'They were very successful during the year July 2008 to June 2009. Alan Wingrove had organized some very successful meetings for the September quarter but, as he had moved to Chichester last Christmas, I volunteered to help in April. We often have between twenty and thirty people at our meetings. We had talks on parakeets from David Ross and whether they are a threat to native birds; a talk from our chairman, David Lindo, on birdwatching in Wormwood Scrubs, a talk on progress on the BTO *Atlas* from our BTO representatives, Ian Woodward and Richard Arnold, who organize the London area research. We also had a talk on the BTO research on ringing birds from Mark Grantham.

'We had several talks from David Darrell-Lambert, our former chairman, who gave his usual highly interesting and informative talks with excellent slides. He had previously given us talks on basic bird identification for beginners. This year he gave talks on birds of the Thames, on identifying difficult birds and on identifying finches and sparrows.

'The meetings are held in the Camley Street Natural Park, just behind St Pancras Station. If anyone has not been, the road to the Park is very well lit but the entrance to the park is through some black iron gates — you need to go through the side gate. As those who come will know, the entrance to the Park is in darkness apart from the street lighting, and I am afraid Camley Street says it is too expensive to install outdoor lights. But you just need to head through the gate and towards the brightly lit premises, and up the steps on the left.

'We welcome any suggestions for indoor meetings — particularly if members would like more talks on basic bird identification and, if not, what subjects would interest you.'

Andrew Self reports on the Records Committee: 'In 2009, there has been one change of recorder with Richard Bonser now covering Inner London in place of Des McKenzie, who has stood down after many years. Des will be completing the 2008 records and Richard has already started on the 2009 records. We are changing the way we complete our database this year. This has been on the cards for a while as the software we have been using — COBRA — is really quite old and not up to the job any more. It is also incompatible with modern computer-operating systems. The database manager, Steve Spooner, will be sent all the records from the individual recorders and then forward them to GiGL, who will import them into their database and run off the collated records for 2007, which I can then send out to the authors for the *LBR*.

'In agreement with the Rarities Committee, we have decided to review all records of Caspian gull which we had previously published in the *LBR*. It had become apparent that there was a lot of misidentification concerning this species so basically we are starting again. This will give us the opportunity to examine critically all records of this gull, which is still relatively rare in London. To help people identify this gull in the future, I managed to persuade the author of an identification paper on Caspian gulls to agree to publish it in the 2006 *LBR*. There has been widespread acclaim for this paper — the first major colour-identification paper ever published in the *LBR*. Along with the other papers, expanded species accounts and superb colour photos I believe the 2006 *LBR* is the best one that we have ever produced.'

The Lee Valley Spring Wildlife Weekend was held in May 2009 and Mike Trier organized the LNHS stand. It was again held at the Waterworks Nature Reserve, Leyton. Despite poor weather, there were many visitors. This year we shared the stand with Hackney Wildlife, run by Mark Pearson, our Middlesex bird recorder. His enthusiasm for the LNHS and his powers of persuasion resulted in the number of new members escalating from sixteen in 2008 to twenty-two in 2009. Many visitors knew of the LNHS via the website and at least one person joined after David Lindo promoted it during his talk. Angela Linnell organized the LNHS stand at the Rainham Country Fayre in September but, despite wonderful weather, we had very little interest in the stall and we were very disappointed with sales.

The Committee look forward to hearing from members who want to make suggestions to improve the work of the London Bird Club. We hope you will take the opportunity to promote the Club, particularly to younger birdwatchers. We have a lot to offer — including the fact that the LNHS covers plants, insects and all aspects of natural history. We also hope you will suggest topics for our indoor meetings and come along on the weekly field trips, where you will find some of London's hidden gems with the chance of seeing some wonderful birds.

DAVID LINDO, *Chairman*, ANGELA LINNELL, *Committee Secretary*
(angela.linnell@phonecoop.coop or 020 8508 2932)

The fern flora of inner London

JOHN EDGINGTON
19 Mecklenburgh Square, London WC1N 2AD

Presidential Address delivered at the Annual General Meeting on 16 December 2009

I am not a naturalist born and bred. At the age of twelve I was given Richard Fitter's *London's Natural History* as a school prize — but for mathematics, which may explain my subsequent career as a physicist. However I have always relished outdoor life and eventually joined the LNHS, whereupon I reread Fitter's seminal book with fresh understanding. Written in 1945 by one of our future presidents, it was remarkably perceptive: 'From a biological point of view perhaps the most important effect of the spread of London has been to create . . . an entirely new type of habitat, the wholly-built up area.' Fitter's primary interest here was birds but he did note the appearance of plants, including 'an occasional small fern growing in some damp grating'. It is these ferns, in this habitat, that interest me as I travel through inner London. Male-fern *Dryopteris filix-mas* and hart's-tongue *Asplenium scolopendrium* lurk behind leaky drainpipes, bracken *Pteridium aquilinum* (the only species Fitter mentioned) sprouts from paving cracks, and various small spleenworts grow on Victorian brickwork. Even rustyback *A. ceterach*, more commonly associated with south-west England, thrives beneath the city's skyscrapers. Some ten years ago I began to wonder whether ferns had always been so widespread, and if not, what had changed, and why, and what might the future hold? Here I try to answer some of these questions.

With fewer than fifty native species, most of them wintergreen, ferns are distinctive, easily recognized and generally abundant throughout Britain, by streams, in woods and, where natural stone is missing, on old walls. They are good colonizers and London has walls and open woodland in plenty, so one might expect ferns to be well represented in the capital. But this was certainly not the case in the past. For ease of comparison with historical data, I shall confine myself to that part of central London that Trimen and Dyer (1869) in their *Flora of Middlesex* called the Metropolitan district. Coterminous with what was the Metropolitan Board of Works, later the London County Council area north of the Thames, this stretches from Putney Bridge eastward to the River Lea, and northwards to Highgate and Tottenham, an area of some 140 km^2 (Figure 1). In 1869 hardly a fern grew here. Trimen and Dyer recorded male-fern once, in Ken Wood, and found two sites each for bracken, wall-rue *Asplenium ruta-muraria* and polypody on walls. Commenting that 'ferns are naturally poorly represented in Middlesex' they noted that in 1746 John Blackstone had recorded wall-rue on a grave in Fulham Churchyard, and rustyback and maidenhair spleenwort *Asplenium trichomanes*, both long extinct by 1869, on walls in Hackney and Chelsea respectively.

Subsequent records, mostly due to members of the LNHS, showed little change. E.W. Robbins and E. B. Bishop, successive presidents of the Society, together with H. Spooner, published *Botanical records of the London area* (Bishop et al. 1928–1936). Their records for the district from 1900 to 1936 mentioned just three ferns — bracken, wall-rue and male-fern (the last, they noted with some surprise, 'even in inner London'). In compiling *A hand list of the plants of the London Area*, D.H. Kent and J.E. Lousley (another of our presidents) (1951–1957) covered the ground exhaustively but by 1957 had only increased the total to four — the addition being a plant of hart's-tongue found on a bomb-site in 1952. Indeed, the bomb-site flora of 342 species recorded by A.W. Jones (1958) included only three ferns. In his comprehensive

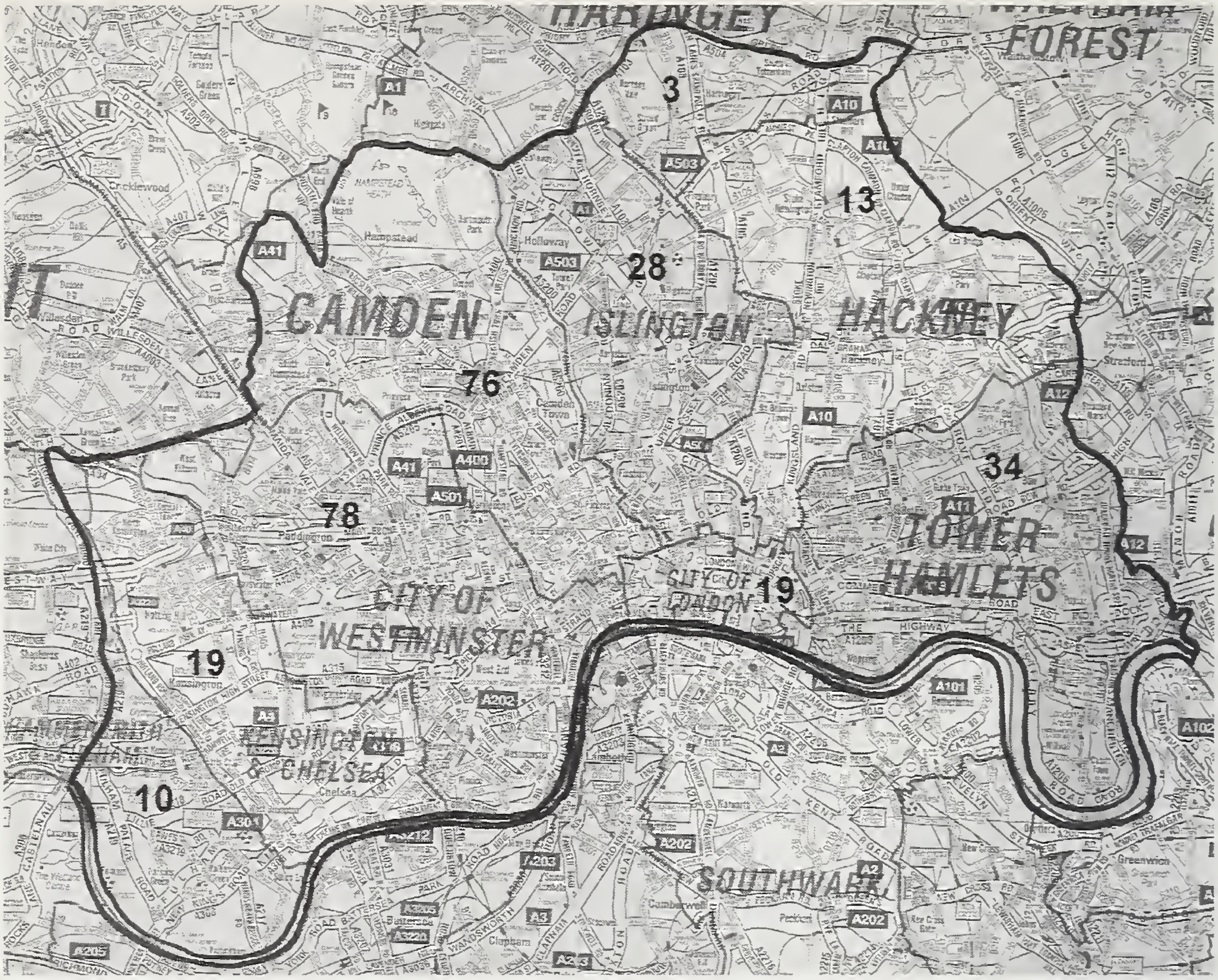

FIGURE 1. The Metropolitan district of vice-county Middlesex. The number of records of wall ferns in this survey is shown for each borough.

The historical flora of Middlesex, D.H. Kent (1975) added four transient records; lady-fern *Athyrium filix-femina* and broad buckler-fern *Dryopteris dilatata* appeared briefly in a Holborn basement in 1965, while specimens of maidenhair fern *Adiantum capillus-veneris* and Cretan brake *Pteris cretica* had also come, as escapes from cultivation, and gone. Kent's (2000) posthumous *Supplement to the historical flora* included two more notable records for the Metropolitan district. In 1980 Rodney Burton, yet another of our presidents, recorded black spleenwort *Asplenium adiantum-nigrum* for the first time, while maidenhair spleenwort was refound almost exactly 250 years after Blackstone had last seen it. Overall, the *Supplement* indicated that at the turn of the millennium, three species — bracken, male-fern and hart's-tongue — were widespread while there were twenty-nine localized records for thirteen others including three non-native species.

The picture has changed dramatically in the last ten years. Sixteen native species (Table 1) have been recorded on walls and other man-made structures in the Metropolitan district (records from Hampstead Heath and other semi-natural areas in the district have been excluded from this tally). A similar number of exotic species has been recorded (Table 2), some of which seem to have established themselves permanently. Table 1 includes a comparison with the late 1950s when D.H. Kent (1961) found only seven ferns growing on 500 walls spread across the whole of Middlesex. Along with more species has come a great increase in their abundance, most marked perhaps for hart's-tongue. Kent found this was rare in inner London, most plants being small and infertile. Now, like bracken and male-fern, it is ubiquitous, to be found somewhere in virtually every 1-km square, as widely distributed on London's walls as Guernsey fleabane is on its pavements. Plants produce large, highly fertile fronds in dense colonies, sometimes to the exclusion of other wall vegetation (Figure 2). This change has been noted at a national scale by Braithwaite et al. (2006) who suggest that a vigorous variety of hart's-tongue introduced as garden stock, along perhaps with climate change, may be responsible. Bracken, the first fern to colonize bomb-sites in the 1940s, is now the least common of the three (a change that seems to parallel the rapid rise and subsequent decline of rosebay willow-herb as a colonist of open disturbed ground) while male-fern is nearly as common as hart's-tongue though less often fertile.

Table 1. Number of records of native ferns in inner London, 1999–2009, in order of abundance, compared with the number of records on 500 walls in Middlesex surveyed by Kent (1961). Numbers for *Polypodium interjectum* and *P. vulgare* exclude 18 records of *Polypodium* not identified to species.

Native ferns	This survey	Kent
Asplenium scolopendrium	ubiquitous	21
Dryopteris filix-mas	ubiquitous	174
Pteridium aquilinum	ubiquitous	64
Asplenium trichomanes	69	4
Asplenium adiantum-nigrum	56	
Asplenium ruta-muraria	32	9
Polypodium interjectum	23	
Dryopteris dilatata	12	
Polypodium vulgare	12	2
Polystichum setiferum	8	
Asplenium ceterach	6	1
Adiantum capillus-veneris	3	
Athyrium filix-femina	3	
Dryopteris affinis	1	
Dryopteris carthusiana	1	
Polystichum aculeatum	1	

Almost as striking is the increase of the three small spleenworts. Wall-rue has always been present in very small quantities, but maidenhair and black spleenwort have both come from nowhere to being, in some areas of the city, more in evidence than bracken. Typically they grow in rotting mortar beneath the coping of brick walls in basement areas, in a damp shady environment protected from sun and frost. The most hospitable walls seem to be made of impermeable glazed or engineering bricks which direct rain water and nutrients into the mortar courses. Wall-rue is less choosy, often growing in more exposed sites; an unexpected pleasure of the survey was the discovery of wall-rue on a chest grave in the churchyard of All Saint's, Fulham, very likely the same spot where Blackstone found it in 1746 (Figure 3).

TABLE 2. Number of records of non-native ferns in inner London, 1999–2009. An asterisk indicates a species known to be apogamous. A question mark indicates that identification is uncertain to specific level. The list includes a few plants recorded just south of the Thames.

Non-native ferns	This survey
Adiantum raddianum	6
**Cyrtomium falcatum*	3
**Cyrtomium fortunei*	4
**Cyrtomium macrophyllum*	3?
Doodia australis	1
**Dryopteris cycadina*	2
**Dryopteris erythrosora*	1
**Pellaea falcata*	1
**Pellaea rotundifolia*	1
**Polystichum polyblepharum*	3?
**Polystichum tsus-simense*	5
**Pteris cretica*	3
Pteris multifida	1
**Pteris nipponica*	4
Pteris tremula	2
**Pteris vittata*	1

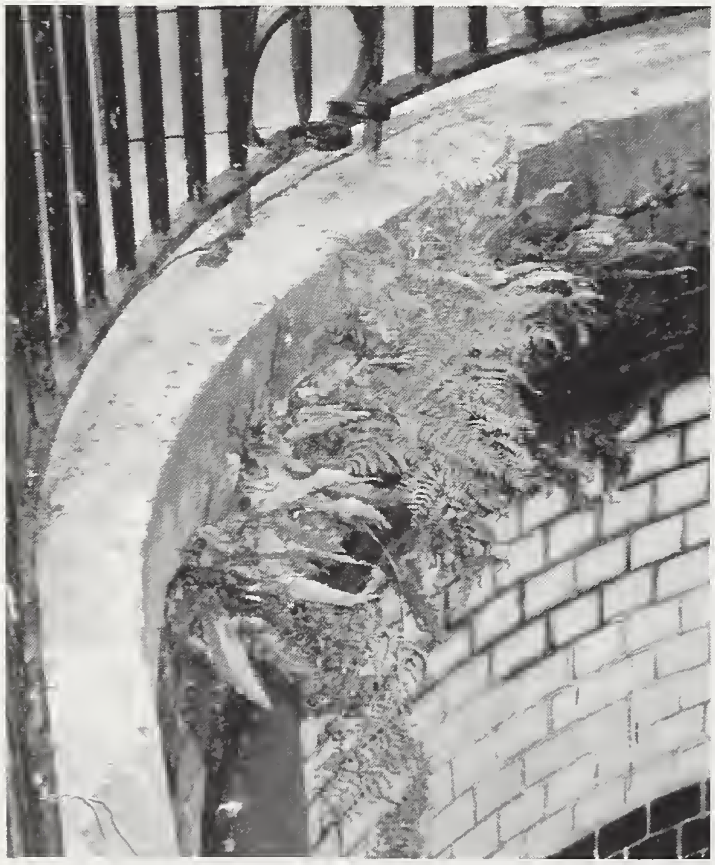

FIGURE 2. A dense colony of hart's-tongue fern, male fern and bracken in a basement area near Tottenham Court Road.

In mature habitats, established plants occupy most of the sites they are capable of colonizing. Expansion into virgin territory is unusual and usually only happens when invasive species are introduced. Because both maidenhair and black spleenwort have only very recently appeared in central London it has been possible to follow their spread almost from the beginning. A map of the distribution of maidenhair spleenwort (Figure 4) suggests a fall-off in density of sites away from Bloomsbury where Geoffrey Kitchener found it in 1996. If indeed all plants recorded in the survey ultimately derive from this 'founding' colony then a model of long-distance dispersal can be constructed which allows the average distance of spore travel to be estimated. This turns out

(Edgington 2009) to be equal to the average distance between nearest-neighbour colonies, which is 750 metres. The model fails as soon as secondary colonies start to populate their own neighbourhood but it is plausible that this has only happened to a limited extent during the survey. The distribution of black spleenwort is quite similar and the average distance of spore dispersal is again found to be 750 metres. With an identical dispersal process and near-identical spores and habitat preference, this agreement goes some way to validating the correctness of the model. A comparable case, also involving spore-producing plants, was a study of the spread of bryophytes in the Adirondacks of the eastern United States, which yielded similar results to this (Miller and McDaniel 2004).

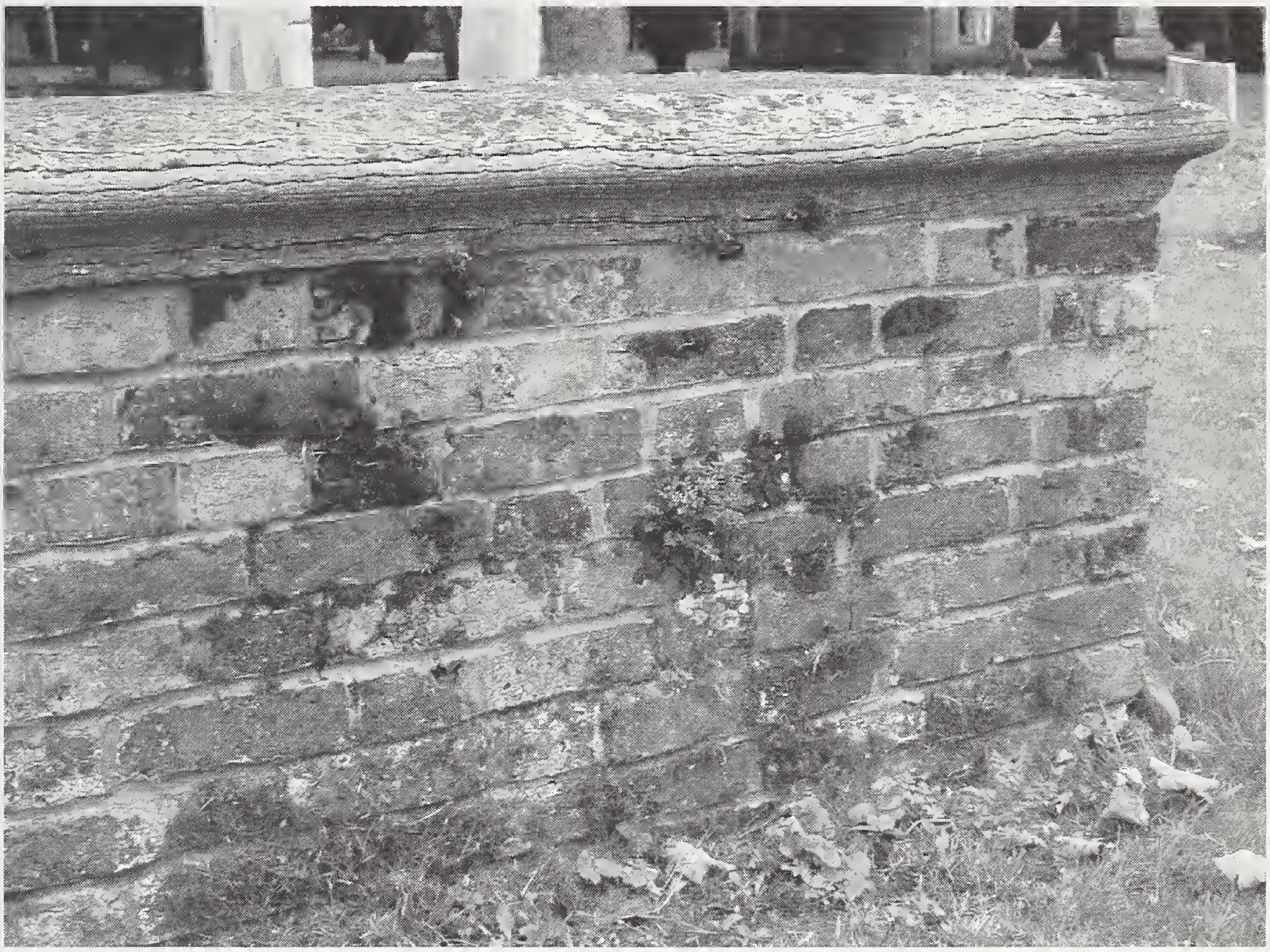

FIGURE 3. Wall-rue growing on a chest grave at All Saint's, Fulham.

Another fern now present in considerable abundance is polypody, represented in London by two species not easily distinguishable except under the microscope. The majority of records are of intermediate polypody *Polypodium interjectum* which seems to have displaced common polypody *P. vulgare* in London since Kent's (1975) *The historical flora of Middlesex* in which he wrote that all the specimens he had seen were this taxon. Sites are scattered widely and apparently randomly across inner London, consistent with most plants arising from spores from the mass plantings which are so common in civic gardens. Common polypody is a calcifuge, unlike intermediate polypody for which mortared walls provide its preferred lime-rich substrate.

Most of the remaining native ferns found on inner London's walls are normally woodland plants. Interestingly, the records of soft shield-fern *Polystichum setiferum* are little fewer in number than those of broad buckler-fern, in contrast to the overwhelming dominance of the latter in most of the Society's recording area (Burton 1983). The popularity of soft shield-fern as a bedding plant may be partly responsible but is not the full story as the plants

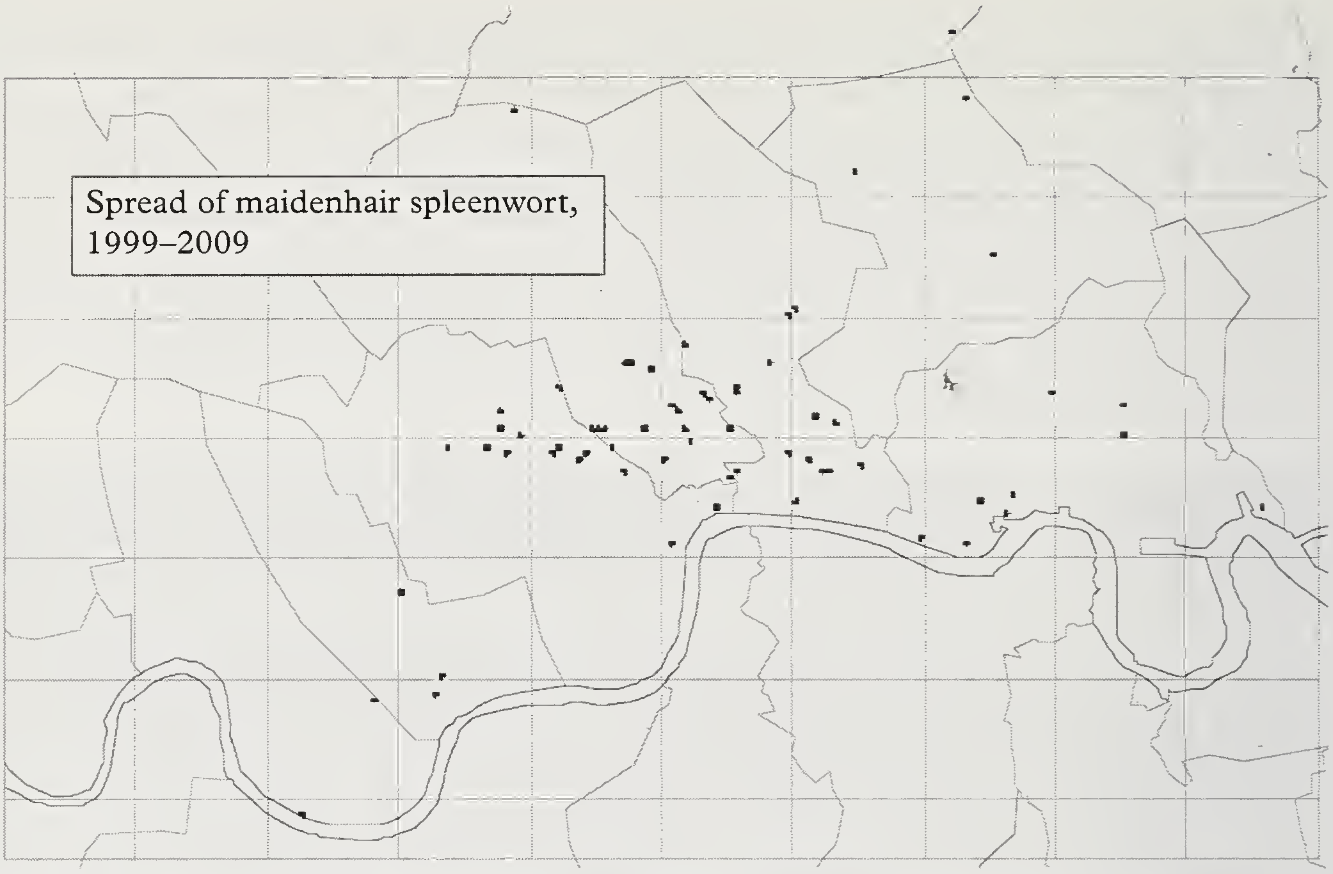

FIGURE 4. Sites where maidenhair spleenwort *Asplenium trichomanes* was recorded between 1999 and 2009.

recorded in walls in this survey, like the considerable numbers now appearing in London's more-natural habitats, are not the cultivars favoured by gardeners. This fern, like hart's-tongue, has increased greatly on a national scale (Braithwaite et al. 2006), a change that is so far unexplained.

During the ten years to the end of 2009 the number of ferns recorded on inner London's walls increased tenfold. They are not uniformly distributed, as Figure 1 shows. Recorder bias is certainly responsible for some of this variation but other factors are involved. The larger numbers in Camden, Tower Hamlets and Westminster are due to the many old damp brick walls in basement areas and on railway viaducts in these boroughs. Kensington and Chelsea have many white-painted stucco buildings without exposed mortar receptive to spores, while the streets of Hackney and north Islington were developed to a lower density and generally lack basement areas below street level. Notwithstanding these details, and acknowledging that much more attention is paid to urban habitats than was once the case, it is fairly clear that such an abundance of ferns would not have been missed by the illustrious botanists who surveyed London in the past. What has happened?

I suggested, in an earlier paper in *The London Naturalist* (Edgington 2003), that the decline in atmospheric sulphur dioxide following the Clean Air Act of 1956 and subsequent legislation removed a barrier to germination and growth that impedes and, at a certain level, totally prohibits the spread of ferns. There is convincing evidence for this barrier. For example, Lawrence and Ashendon (1993) showed that sulphur dioxide gas is highly injurious to intermediate polypody, hart's-tongue and scaly male-fern *D. affinis* at levels exceeding about 100 micrograms per cubic metre ($\mu g\ m^{-3}$). Wada et al. (1987) found similar results for maidenhair fern and there is little reason to doubt that the phenomenon is general. Noticeable damage can be expected above, say, 20–30 $\mu g\ m^{-3}$, a concentration exceeded in central London between 1815 and 1990 (Figure 5), sometimes by enormous amounts — in the great smog of 1952 the highest reading was 3,825 $\mu g\ m^{-3}$. The prevalence of pea-souper fogs in Victorian times, and later, exacerbated the problem by forming a fine mist of sulphite in solution, so-called 'occult deposition' (for reasons not fully understood, the number of foggy days in London peaked around 1900 and has declined ever since). Recent measurements show a continuing decline in sulphur dioxide even in the city centre, to levels little above the 2 μg m^{-3} of the surrounding countryside. Thus, a plausible reason for the decline of urban ferns to the point of extinction in the nineteenth and early twentieth centuries, and their subsequent resurgence, is the effect of sulphur dioxide pollution (and not indiscriminate collection, which affected only the large attractive woodland ferns). A recent study of wall ferns in Hull (Middleton 2010) comes to the same conclusion regarding that city.

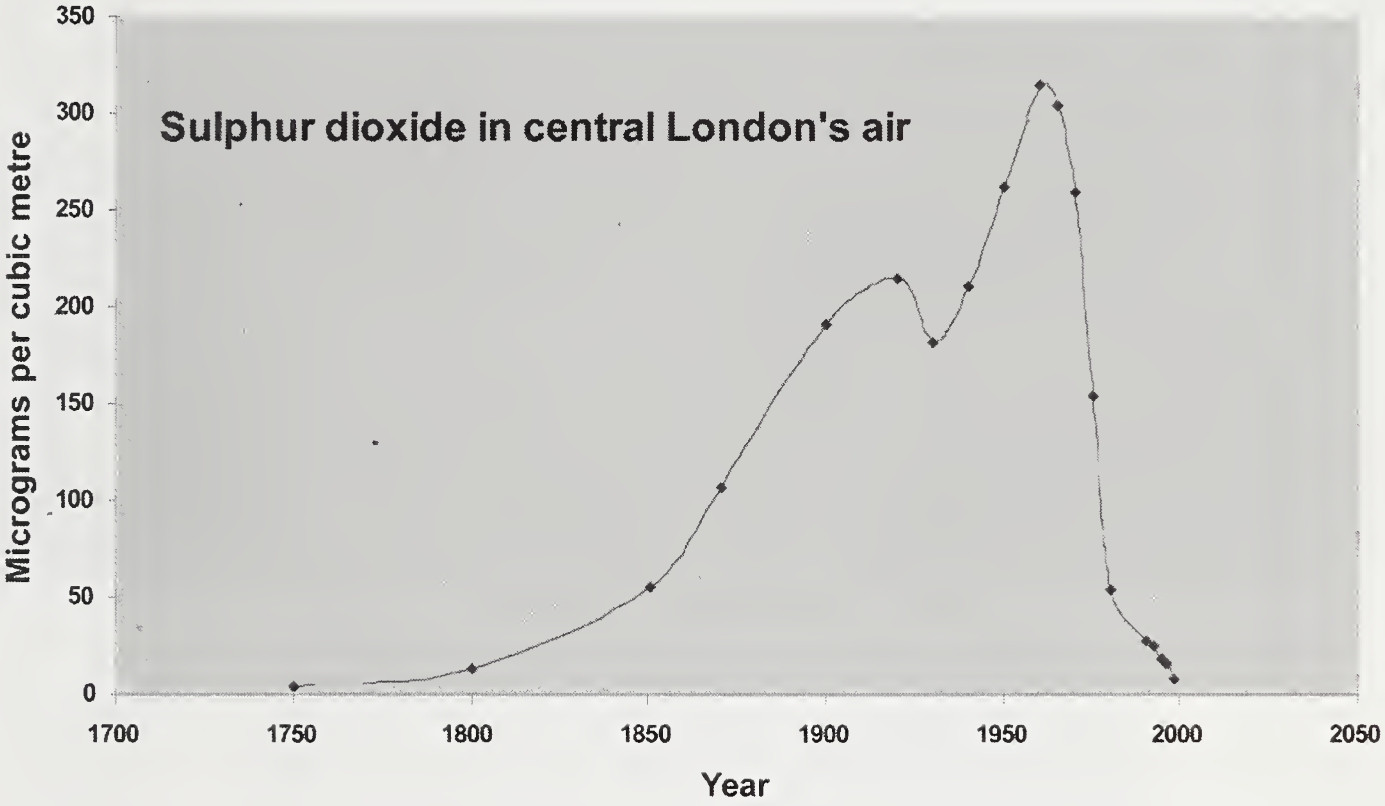

FIGURE 5. The rise and fall of sulphur dioxide in London's air since the beginning of the industrial revolution. Data before modern instrumental records are estimated from records of coal consumption.

As sulphur dioxide declines, exposed surfaces revert to their normal neutral or (in the case of mortar) slightly alkaline state. This raises the possibility of the return of calcicole ferns as epiphytes on trees. Burton (1983) mentioned a polypody that grew on hornbeam in Epping Forest as late as 1952. In 2006, intermediate polypody was found growing on a fallen willow on Hampstead Heath (Figure 6), while in 2009 a London plane in a Fulham street was the host (Figure 7). Other instances may be expected.

At the height of the Victorian fern craze, between 1850 and 1890, hundreds of exotic ferns were available from specialist suppliers, together with the Wardian cases in which they had to be grown to shield them from the polluted atmosphere (Wittingham 2009). The craze has subsided but there is still a respectable trade in both hardy and tender ferns — a recent catalogue from a specialist grower offers over 130 species. As they can now grow unprotected in the open air or in conservatories, it is to be expected that some will escape, and this is confirmed by the presence of so many alien species among the records (Table 2).

Some, such as the house holly fern *Cyrtomium falcatum*, and its relative *C. fortunei* (Figure 8), and brake ferns in the genus *Pteris*, have been recorded many times as casual plants in various parts of southern England. Others, such as *Adiantum raddianum* (Rumsey 1998), *Doödia australis* and members of the

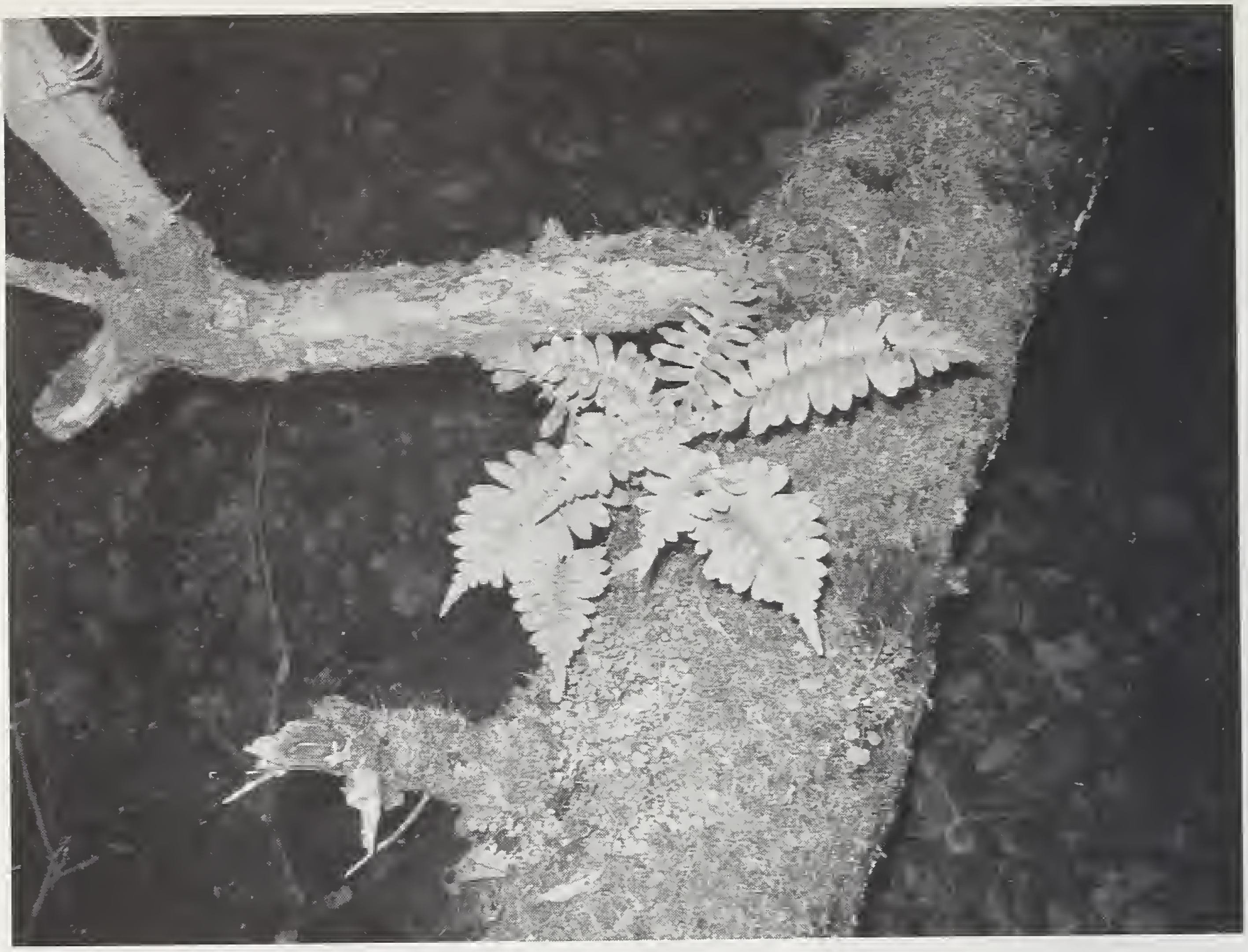

FIGURE 6. *Polypodium interjectum* on dead willow, Hampstead Heath.

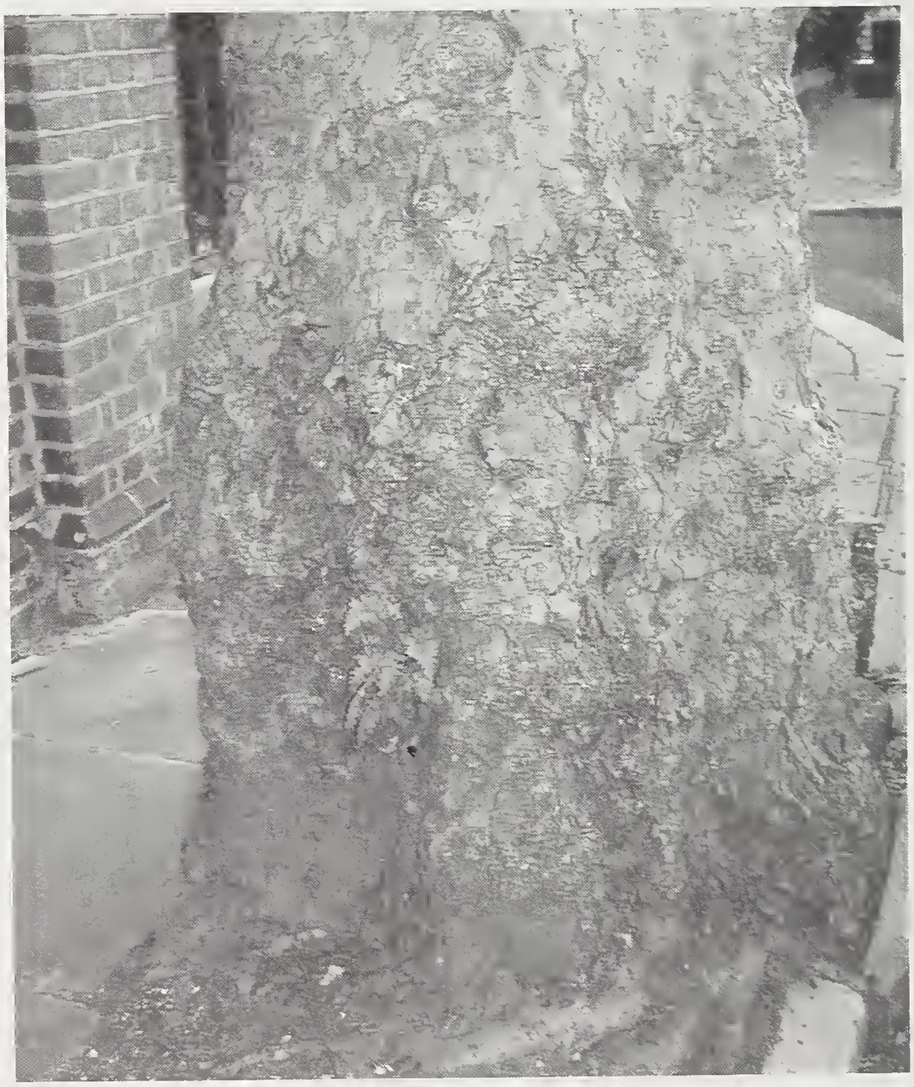

FIGURE 7. *Polypodium interjectum* on living London plane, Fulham.

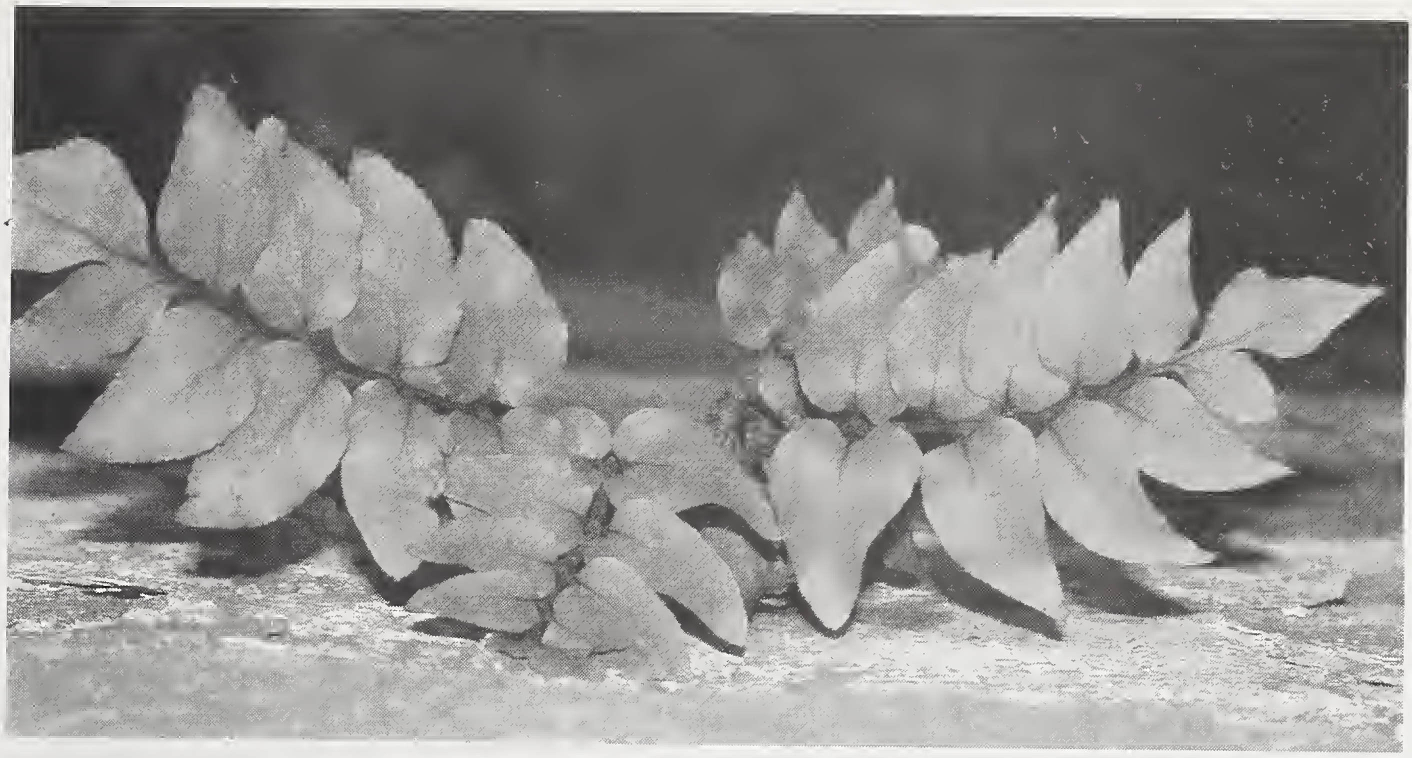

FIGURE 8. *Cyrtomium fortunei* on the wall of the Goldsmith Company's Assay Office in the City of London.

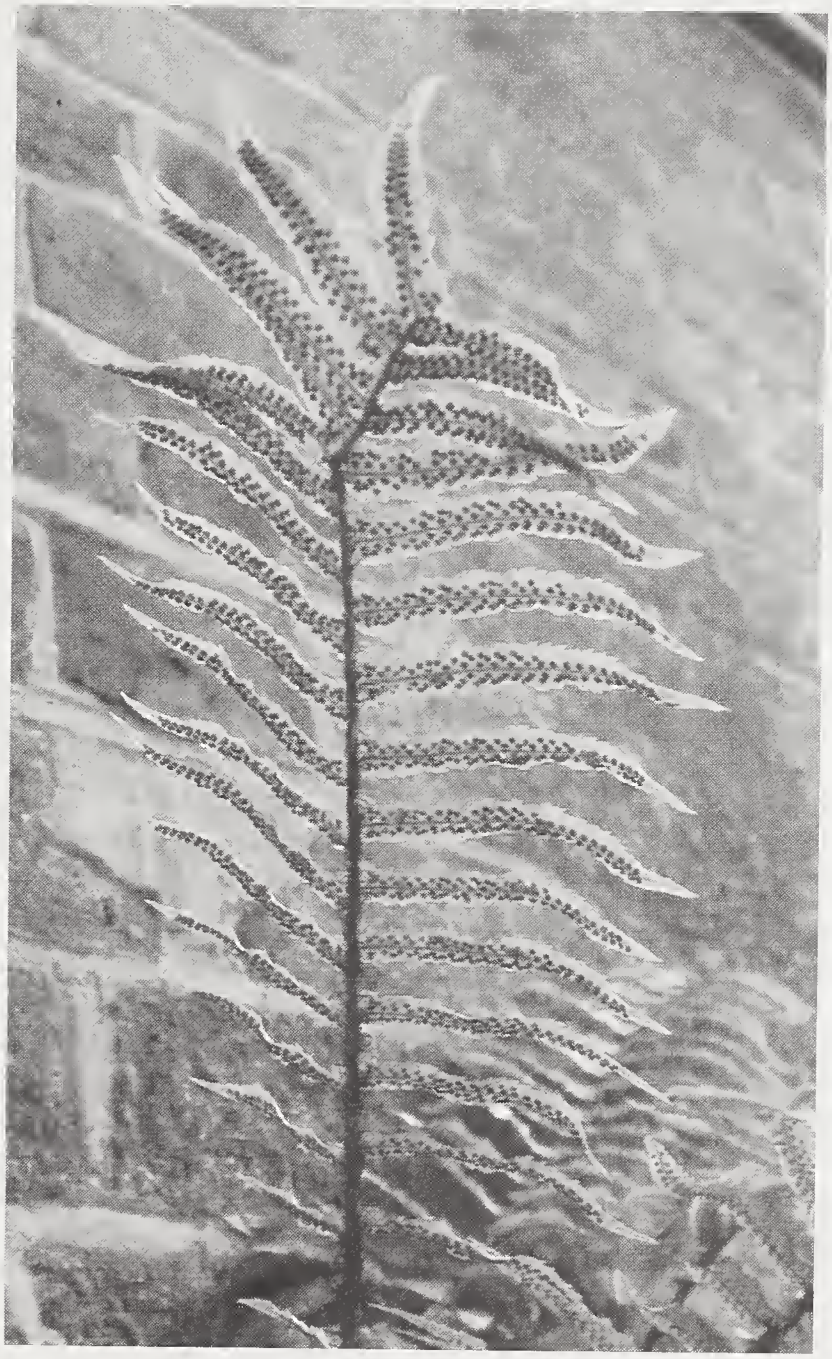

FIGURE 9. *Dryopteris cycadina* on the boundary wall of St George's Gardens, Holborn.

genus *Polystichum* were recorded for the first time in Britain during the course of this survey. The shaggy wood fern *Dryopteris cycadina* (Figure 9), from America, is a particularly robust escape from larger gardens and likely to become a permanent member of London's flora.

The mechanisms which allow these immigrants to escape from cultivation are interesting. The ferns we see (the sporophyte generation) produce spores that on germinating form small green plants called prothalli which develop male and female sex organs (the gametophyte generation). The normal method of reproduction is outbreeding, an egg on one prothallus being fertilized by sperm which swim to it from another. Self-fertilization may also occur, permitting reproduction even when only one spore is available. But ferns of dry, rocky habitats, including most of the alien species recorded in London as well as many of the natives, have evolved an alternative asexual process whereby the sporophyte grows directly from the prothallus. This breeding behaviour, known as apogamy, permits reproduction in circumstances where no water is available for sperm motility, or (like self-fertilization) where only one spore is available. Though only 10 to 15 per cent of ferns worldwide are apogamous, most of London's alien ferns, and some of the natives too, are apogamous, either obligately or if sexual reproduction is inhibited. Most of the rest, particularly the spleenworts, are capable of self-fertilization. Thus the problems of spore scarcity, and of dry habitats, are solved, at the expense of evolutionary stasis due to lack of gene interchange.

Establishment is one thing; survival is another. Ferns from the tropics would not survive even a moderately benign British winter, let alone the more severe recent seasons, were it not for London being a 'heat island'. The average night temperature in July within four or five miles of the British Museum (corresponding approximately to the Metropolitan district) is more than 5°C above that of the countryside around. This is adequate to protect even frost-sensitive ferns such as *Adiantum raddianum* (and its native congeneric *A. capillus-veneris*), plants of which came through the hard winter of 2009/10 unscathed.

Though London's microclimate is rather special, the extraordinary increase in its fern flora has to some extent been paralleled elsewhere, if not yet on such a scale. This has been most obvious in Belgium and Holland where active botanists have reported the recent appearance of many of the same exotic taxa that have been found in London (Verloove et al. 2007). No doubt something similar is happening in other British cities (Hull has been mentioned) and it would be interesting to hear about it.

The greatest threat to London's fern flora is not climate change or pollution, but civic tidiness, wholesale refurbishment of buildings and replacement of soft lime mortar with hard Portland cement. The rosy-pink fronds of *Doodia australis* in Bloomsbury and the glossy blue-green of *Pellaea rotundifolia* in Mayfair have fallen victim to the wall-scraping brigade (the same iconoclasts whose misplaced reverence for butterfly bush spares the truly destructive menace of *Buddleja*). Many native ferns, with abundant fresh supplies of spores, can cope with these attacks, but probably half the exotic ferns found in the last decade have since been lost. Fortunately some, such as *Dryopteris cycadina*, *Adiantum raddianum* and *Cyrtomium* species, appear to have the resilience to survive and new sites for others are still being discovered. The number of records of both native and non-native ferns since 2000 has fluctuated around thirty each year. Until the old sites have been revisited we shall not know whether the fern flora of inner London is increasing still, as it appears to be, or whether losses outweigh new colonization. That would be an interesting and useful project for the Society, in the 'entirely new type of habitat' that Fitter recognized sixty-five years ago.

Acknowledgements

More people than I can name have helped and encouraged me since I joined the London Natural History Society. Among those who have provided records for this paper and willingly taken the trouble to identify many of the ferns are Nick Bertrand, Piet Bremer, Rodney Burton, Roger Golding, Howard Matthews, Alison Paul, Fred Rumsey and Filip Verloove, to all of whom this account is dedicated.

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Book review

The Carrifran Wildwood Story. Myrtle and Philip Ashmole and members of the Wildwood Group. Borders Forest Trust, Jedburgh. 2009. 224 pp., paperback £15. ISBN 978 0 9534346 4 0.

'Acts of creation are ordinarily reserved for gods and poets, but humbler folk may circumvent this restriction if they know how.'

Aldo Leopold's plea for humanity to appreciate a more respectful view of nature infuses the whole Carrifran Valley Project. This admirable blow-by-blow account has been published to celebrate its tenth anniversary. As well as spearheading one of the most ambitious and farsighted ecological restoration projects in these islands, Myrtle and Philip Ashmole have produced a comprehensive and intriguing account of its first ten years. They detail the history of how the money was raised (with difficulty, over many years) to purchase this denuded valley in the Scottish Borders, and how the restoration project was planned and executed (involving many experts and supporters, several nit-picking national agencies and hundreds of volunteers). As a lesson in how such an ambitious enterprise can be successfully undertaken, it is exemplary.

From the start, a meeting at Kindrogan Field Centre, attended by your reviewer, the idea was to re-create a 'wildwood' — so far as possible the natural vegetation of the valley at the peak of its botanical diversity around 6,000 years ago. This was before the effects of people with axes and domestic grazing animals — sheep, goats and cattle — had denuded the place. With minimal sources of seed within the valley (most of the tree species had become extinct at Carrifran) it was decided early on that a substantial planting effort would be needed. The team took great care, using pollen data to guide them, to ensure that all the trees planted were genetically diverse and from places as similar to the valley as possible. The book details every aspect of the project, not shying away from the contentious issues and how they were solved. Should they plant small-leaved lime? Where to get appropriate acorns? Should deer-fencing be used? How to deal with feral goats? Should there be an interpretation centre, or even a car park? The often conflicting views of experts, campaigners and local residents, and the resolutions achieved, are all detailed here.

The book handles some of the contradictions and absurdities of official policies and local opinion with sensitivity and there is evidence of not a little suppressed frustration. Scottish Natural Heritage's veto on the planting of dwarf birch on the grounds that it was not recorded from the valley or nearby (although it occurs in similar habitats in other parts of Scotland, in Cumbria and in Northumberland) is one of these. Other regulations such as the Forestry Commission's disallowing of more than 10 per cent of native planting being 'shrubs' (hazel being included in this category) were equally frustrating based as they are on thinking from the age when timber production was the Commission's only function. Perhaps it is too much to expect that regulations enforced by specialized and grant-giving agencies are kept up to date with contemporary understanding.

Perhaps more attention should have been paid to the relic invertebrate fauna of the valley, as this will surely diversify in response to the increasing tree cover and changing ground flora providing valuable evidence of how a restored ecosystem develops. Some lists of the invertebrates present and their relative abundance would have been most interesting. A list of references would also have been useful.

The Carrifran Wildwood Story is beautifully designed and produced, combining details of the project in words and photographs, quotes from visionaries such as Aldo Leopold, with some of the paintings, poems and personal statements that the restoration of this wild valley has inspired. While I must admit a personal connection with the project, I strongly recommend this book to anyone interested in natural history and the future of our natural environment.

EDWARD MILNER

London Natural History Society's 150th Anniversary Walk: London Fields to The Barbican, Tuesday 17 June 2008

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Introduction

What is now the London Natural History Society (LNHS) has two precursor societies, the older of which was the Haggerstone Entomological Society whose inaugural meeting was held in the Carpenters' Arms in Martha Street, Haggerston on 17 June 1858. The story of the next hundred years is well summarized in LNHS presidential addresses of the 1940s and 1950s (Payne 1948, 1949 and Castell 1958). Castell's paper was reprinted in the Society's 150th anniversary publication *London's changing natural history* (Burgess 2008) together with a short article by Tony Barrett (2008) reflecting on some of the changes in the fifty years to 2008.

Exactly 150 years after the inaugural meeting, seventeen of the Society's current members met at London Fields overground station for a celebratory evening walk which was to pass close to the first two meeting places of the Haggerstone society. Our route took in some of the areas of green that survive (or have been deliberately constructed) in what is now inner-city London but in 1858 was on the fringe of the metropolis. Following long-standing LNHS practice we chose a railway station as our starting point so enabling participants to arrive by public transport. However, in 1858 that would not have been possible as the railway alongside London Fields was not constructed until the 1870s. The buddleia *Buddleja davidii* currently growing on its walls was not brought to Britain until the 1890s and was not recorded as an escape from cultivation until the 1920s.

From the station we passed the Pub on the Park to enter London Fields which historically was part of the Lammas lands of Hackney, providing autumn and winter grazing for the commoners' sheep and cattle. By 1866 it was described as having become 'the run of the riff-raff and vagabonds' and in 1872 it was taken over by the Metropolitan Board of Works as a public park (Crowe 1987). A wooded area planted with a variety of native shrubs was being managed for wildlife by the London Borough of Hackney and an area of grass had been left uncut in the interests of wildlife. We traversed an all-weather playing field surface dominated by buck's-horn plantain *Plantago coronopus* but with a few other species such as pineappleweed *Matricaria discoidea* which can flourish in an open trampled habitat.

Leaving London Fields at the southern end, we crossed at the traffic lights into Broadway Market. Traffic lights would have been a strange sight to the Haggerstone entomologists — they were not introduced to London until 1868 and it was more than fifty years later before they were powered by electricity. At the far end of the market we came to the Grand Union (Regent's) Canal which the Haggerstone entomologists would have known as it was completed in 1820. While walking eastwards along the towpath to the next bridge we noted the following plants among others: hemlock water-dropwort *Oenanthe crocata*, both species of ox-tongue *Picris echioides* and *P. hieracioides*, skullcap *Scutellaria galericulata*, false fox-sedge *Carex otrubae* and swinecress *Coronopus squamatus*. The alien Canadian waterweed *Elodea canadensis* we found in the water in 2008 was first recorded in Middlesex in the River Lea below Leabridge in 1854 so could have been present in the Regent's Canal for many years. Eastern rocket *Sisymbrium orientale* and hedge mustard *Sisymbrium officinale* were common along the canal and in many other places right into the City.

We left the canal towpath to walk northwards alongside the eastern side of Queensbridge Road. Close to here in 1858 was the Carpenter's Arms in Martha Street, the first meeting place of the Haggerstone Entomological Society. There they held a convening meeting on 12 June 1858 and a formal inaugural meeting on 17 June 1858. The Society started with twenty members and decided that the officers should be changed quarterly! By the end of the year they had thirty-five members. Martha Street was renamed Angrave Street in 1878 but by the 1960s had been built over. However, the later name is preserved in Angrave Court on the housing estate between Haggerston Road and Queensbridge Road. By 1859 the new Society had moved their meeting place to a large room above a public house, the Brownlow Arms, in nearby Brownlow Street. There they continued to meet until 1887. At that time the area east of Queensbridge Road was occupied by market gardens and nurseries; now it is a large housing estate on land devastated by heavy bombing during the Second World War.

From Queensbridge Road we entered Scriven Street. This is the renamed western section of Brownlow Street. The street used to be lined with small two-storeyed terraced houses with their front doors opening directly onto the pavement. (Similar houses were seen in parts of Bethnal Green later on our walk.) The Brownlow Arms survived as a pub until the 1990s. After several planning applications between 1997 and 2005 the present housing development was built. Back in the early days of the Haggerstone Entomological Society some members thought it inappropriate to meet on licensed premises so their meetings were frequently advertised as taking place at 10 Brownlow Street. Here on 17 June 2008, courtesy of Jan Hewlett, the assembled company drank a toast to our founders and another to the next 150 years of the London Natural History Society.

From Scriven Street we turned left into Haggerston Road noting the lack of an 'e' at the end of Haggerston. The Haggerstone Entomological Society dropped the final 'e' around 1872. After crossing the canal bridge we passed Haggerston Baths, noting its fine weathervane in the shape of a sailing ship. These baths were opened in 1904 at a cost of £60,000. Recently closed, they would cost £6m to repair and bring back into working order and in the process lose the mural ferns (male fern *Dryopteris felix-mas* and hart's-tongue *Phyllitis scolopendrium*) which we observed.

Our next green space was Haggerston Park which we entered through a gate in the high brick wall on the south side of Whiston Road. This is a post-Second World War open space on the site of a former gasworks, a short arm of the canal, a factory, etc. It is part formal park, part recreation area and part space managed for wildlife. It also provides the site for Hackney City Farm. The nature area includes a woodland walk, a (sadly neglected) pond, damp areas and wild-flower planting. The City farm had wild plants growing on a high wall. Near the south-western gate of the park we observed white mustard *Sinapis alba* before crossing Hackney Road into Bethnal Green in the London Borough of Tower Hamlets.

In Ion Square Gardens a small area is managed by Tower Hamlets Council as a 'wild flower meadow' with corncockle *Agrostemma githago*, corn marigold *Chrysanthemum segetum* and Austrian chamomile *Anthemis austriaca*. Austrian chamomile, once only an occasional casual, is increasingly a constituent of wild flower seed mixes giving away their sourcing from countries outside the British Isles. Leaving Ion Square Gardens by the gate at the south-west corner we entered Baxendale Street, one of Bethnal Green's surviving streets of Victorian two-storeyed terraced houses with front doors opening directly onto the pavement. This joins Columbia Road, famous for its Sunday morning Flower Market which may have been the source of wandering-jew *Tradescantia fluminensis* which we found growing in a pavement crack. Via Virginia Road and Hocker Street we approached Arnold Circus, the focal point of the Boundary Estate built by the then newly formed London County Council in the 1890s.

Boundary Estate is not, as might be supposed, part of Shoreditch but of Spitalfields. The houses that the new estate replaced had been built in the early eighteenth century but by the 1890s the area, known as the Nichol, had gone down in the world. 'As the respectable and hardworking part of the Spitalfields population moved eastwards into Bethnal Green, the "Nichol" became a territory inhabited by clans of roughs, who lived partly by casual labour and partly by petty crime . . .' (Rose 1951). This area in the 1890s is the scene of Arthur Morrison's 1896 novel *A child of the Jago.* It is in this area, during the early twentieth century, that Charles Clore, Bernard Delfont and Lew Grade grew up.

At the time of our walk the management of Arnold Circus, with its prominent central bandstand (Figure 1), had been taken on by a local group of Friends and many of the wild flower species noted earlier in Ion Square Gardens featured in their planting scheme. A subsequent makeover consisted mainly of 'prairie planting', a fashionable, low-maintenance, drought-tolerant style of gardening. One wonders how soon Argentine needle-grass (or feather grass) *Stipa tenuissima* may escape to nearby paving cracks as it has done elsewhere in London. From Arnold Circus via Calvert Avenue we turned into the northern part of Boundary Street (one-time boundary between the old metropolitan Boroughs of Shoreditch and Bethnal Green) passing the sadly neglected churchyard of St Leonard's, Shoreditch. The architect of the present church (built 1736–40) was George Dance the Elder who also designed the Mansion House. The steeple is 192 feet tall and the tower houses a peal of thirteen bells (the largest peal in London outside St Paul's). Until recently there was a whipping post and stocks in the churchyard. We noticed various plants growing in the mortar cracks in the churchyard wall.

By now we were in seriously built-up territory and, via Old Street, made for the next open space — Hoxton Square. Natural history interest was limited but the square was being enjoyed by visitors to this now trendy part of town. From there we headed southwards down Tabernacle Street towards the City.

At the junction with Leonard Street we inspected what must be one of the last undeveloped London bomb-sites, currently serving as a car park. The site was locked but we walked round most of its perimeter and peered through the railings. The plants growing here were fairly typical of such sites and included Oxford ragwort *Senecio squalidus,* eastern rocket *Sisymbrium orientale* and thale cress *Arabidopsis thaliana.* More unusual was the profusion of greater quaking-grass *Briza maxima*; there was also a hawkweed *Hieracium* species. From here we went westwards along Leonard Street towards City Road. During the day we could have turned left down City Road and then right into Bunhill Fields Burial Ground (a burial ground for Dissenters). William Blake, John Bunyan, Richard Cromwell, Daniel Defoe and Isaac Watts are among the 123,000 people interred here. The City Corporation has published a leaflet about this open space which is an oasis for wildlife at the edge of the 'square mile'.

Because Bunhill Fields was closed by the time we arrived we crossed City Road into Featherstone Street and continued over Bunhill Row into Banner Street. Here on the left is Quaker Gardens, a small fragment of a former Quaker burial ground, the first freehold property owned by the Quakers, bought in 1661 and used for 12,000 burials until 1855. We walked through the gardens and turned right into Chequer Street where we spotted wall lettuce *Mycelis muralis* living up to its English and Latin names. At Whitecross Street we turned left. Almost immediately after the junction with Fortune Street on

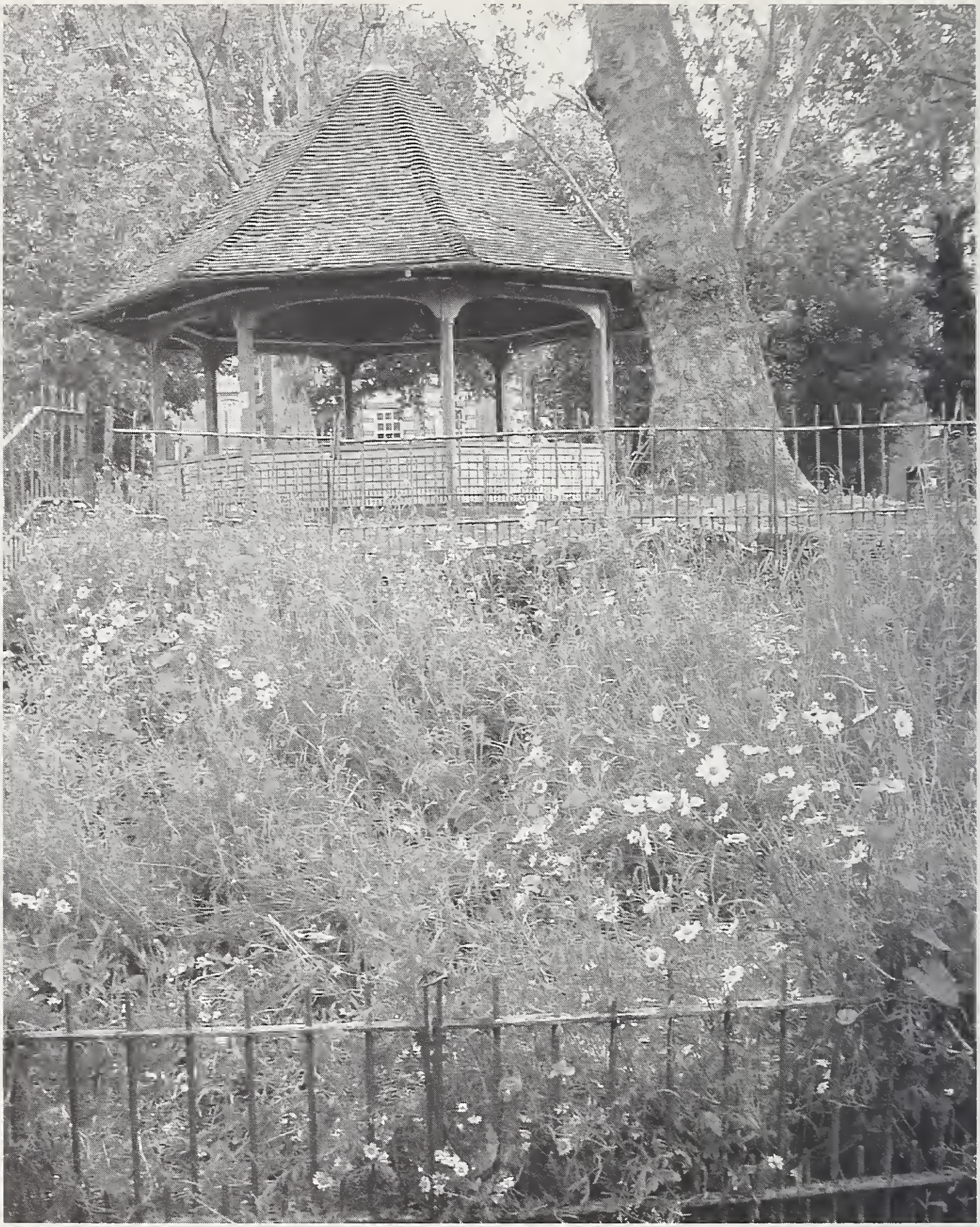

FIGURE 1. Wild flower planting below the bandstand in Arnold Circus, Boundary Estate.
Photo: Mike Trier

our right we dived through an archway in the wall into Shrewsbury Court which led us to Fortune Street Park, a small but well-used open space in another heavily built-up area. We left by the Golden Lane exit and crossed into Fann Street at the far end of which is Fann Street Wildlife Garden, established by the City Corporation on the site of a former burial ground. Behind it we could see the Barbican development which was begun in the 1960s replacing the extensive area of bomb-sites around St Giles' Church, Cripplegate which had been much studied by LNHS members and others in the late 1940s and the 1950s and written up in a series of papers appearing in *The London Naturalist* between about 1948 and 1958.

Just past the Fann Street Wildlife Garden we turned left up a wide ramp and into the Barbican. The section at the top of the slope is built over Beech Street and here is displayed a piece of a 500-year-old beech tree from Burnham Beeches in Buckinghamshire. Burnham Beeches is one of several large areas of common land purchased by the City Corporation in the nineteenth century to preserve open-access land around London. Apparently the composer Felix Mendelssohn Bartholdy enjoyed sitting under the tree, which fell in a severe storm in the 1990s, and he may have composed some of the music for *A Midsummer Night's Dream* while doing so.

A week before midsummer we had enjoyed a warm evening walk recalling the early days of our Society and observing something of the nature of the City (or at least its botany) and reflecting on 150 years of change. We finished our walk near to Barbican Underground station which had opened in 1865, seven years after the Haggerstone entomologists' inaugural meeting, though then known as Aldersgate Street station. If this writer had been aware at the time of the walk that the site of the third meeting place (from 1887) of the Haggerstone Entomological Society was only just round the corner in London Wall we might have ended our walk at Moorgate Underground station instead.

One wonders what route a three-hundredth Anniversary Walk might take?

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FIGURE 2. A toast to the next 150 years of the London Natural History Society.
Left to right: Pam Carr, Mary Clare Sheahan, ?, John Swindells, ?, John Barrington, Helen Schofield, ? and ? (obscured by hands and raised glasses), Mike Trier, Jan Hewlett, Keir Mottram and Catherine Schmitt.
Photo: Mark Spencer

Book review

An odyssey with animals: a veterinarian's reflections on the animal rights & welfare debate. Adrian R. Morrison. Oxford University Press. 2009. 272 pp., hardback, £19.99. ISBN 978 0 19 537444 5.

The author is an American vet whose research on brain activity during sleep led him to investigate the effects of brain lesions. The experimental subjects were cats whose behaviour he studied after they had been operated on while anaesthetized. This, and his outspoken support of other animal experimenters, resulted in physical attacks on his laboratory by animal rights activists, and a subsequent campaign of vilification. Morrison's book is an account of his personal experiences, the animal rights movement in America, and its effect on biomedical research. Though he cites some British incidents such as the attacks on Huntingdon Life Sciences and their suppliers, and the persecution of the physiologist Colin Blakemore, his arena is the United States. I was surprised to learn that it was not until 1985 that the US began to regulate animal experiments with anything like the strictness and ethical standards that had been in force in the UK for years previously. Some of the examples Morrison quotes suggest that procedures and protocols that we would not tolerate here were rife in America at that time. Throughout, Morrison emphasizes his own love of animals and concern for their welfare, while stressing his belief that in any conflict of interests, those of humans must take precedence. He is a passionate proponent of the use of animals in research, striving always for the three Rs — reduction (in numbers), refinement (of techniques) and replacement (with alternatives). He will convince many, but perhaps not all, of his readers.

J. A. EDGINGTON

Wildlife and habitats over ground on the London Underground*

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Summary

With around 3.5 million journeys made each weekday, and more than one billion journeys every year, London Underground (LU), part of Transport for London, is an essential part of any visit to London, and the daily lives of those who live and work in and around the capital.

Not only is the majority of the Underground in fact above ground, it makes up around ten per cent of wildlife habitat in the capital. As such, LU land holdings are essential to the wide range of plants and animals in London, many of which are legally protected. Because of this, the railway lineside environment is increasingly recognized for its contribution to London's greenspace and as a biodiversity asset for London.

Introduction

As a responsible company, biodiversity protection is an integral part of LU's infrastructure management responsibilities, which includes upgrading, replacing and maintaining stations, signals, tracks, embankments, tunnels and bridges, to name but a few.

LU has set out its commitments to ensure it meets the challenges of running a safe and efficient railway, while working with its contractors and conservation bodies to retain a healthy and wildlife-rich network in its Biodiversity Action Plan (BAP). The BAP is being updated in 2010 to coincide with the United Nations Year of Biodiversity.

The BAP, along with a variety of other tools, helps LU fulfil its legal obligations and the aims of the Mayor of London's Statutory Biodiversity Strategy. In meeting its biodiversity objectives, LU ultimately contributes to the conservation of locally, regionally and nationally important species and habitats along its network, as well as making the natural environment accessible for Londoners.

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London Underground and biodiversity

The LU network stretches from the Chiltern Hills in Buckinghamshire in the west to Epping Forest in Essex in the east. It comprises around 400 kilometres of track representing about 4,000 hectares of land, or approximately a tenth of the wildlife habitat in the capital.

The railway network is an important green corridor, linking the capital's open spaces and helping wildlife to move around within a mosaic of habitats, an increasingly important service given the predicted effects of climate change, such as habitat loss. This green corridor is home to a number of legally protected and locally important flora and fauna. Indeed, several of the species and habitats found along the railway have been identified as priorities for conservation at national, regional and local levels. Predictably, the potential contribution of underground tunnels and track areas to such conservation is limited. The dark environment holds little scope for safe survival for most animals and plants. Built structures above ground, or partly exposed at or between stations, do contribute however, providing refuges where particular plants or animals are able to thrive. One example of this is the colonies of Natterer's and Daubenton's bats living in disused tunnels in Highgate. Here work with the London Bat Group has seen population levels rise ten-fold since 2002–03.

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* Based on a presentation given by Dr Marian Kelly, London Underground's SQE Manager Environment and Specialist Advisers, to the London Natural History Society on 22 October 2008.

At a regional level, the Mayor of London's Statutory Biodiversity and Transport Strategies aim to enhance habitats in Greater London by implementing policies for protecting and enhancing biodiversity. Additionally, the Mayor published *Leading to a Greener London* in July 2009; this sets out his vision for the environment, including a 'Making London Greener' programme which, amongst other things, commits to implementing an All London Green Grid and promoting green roofs and walls. These are supported by Draft Replacement London Plan Policy: 2.18 green Infrastructure, and Policy 5.10: Urban Greening, respectively.

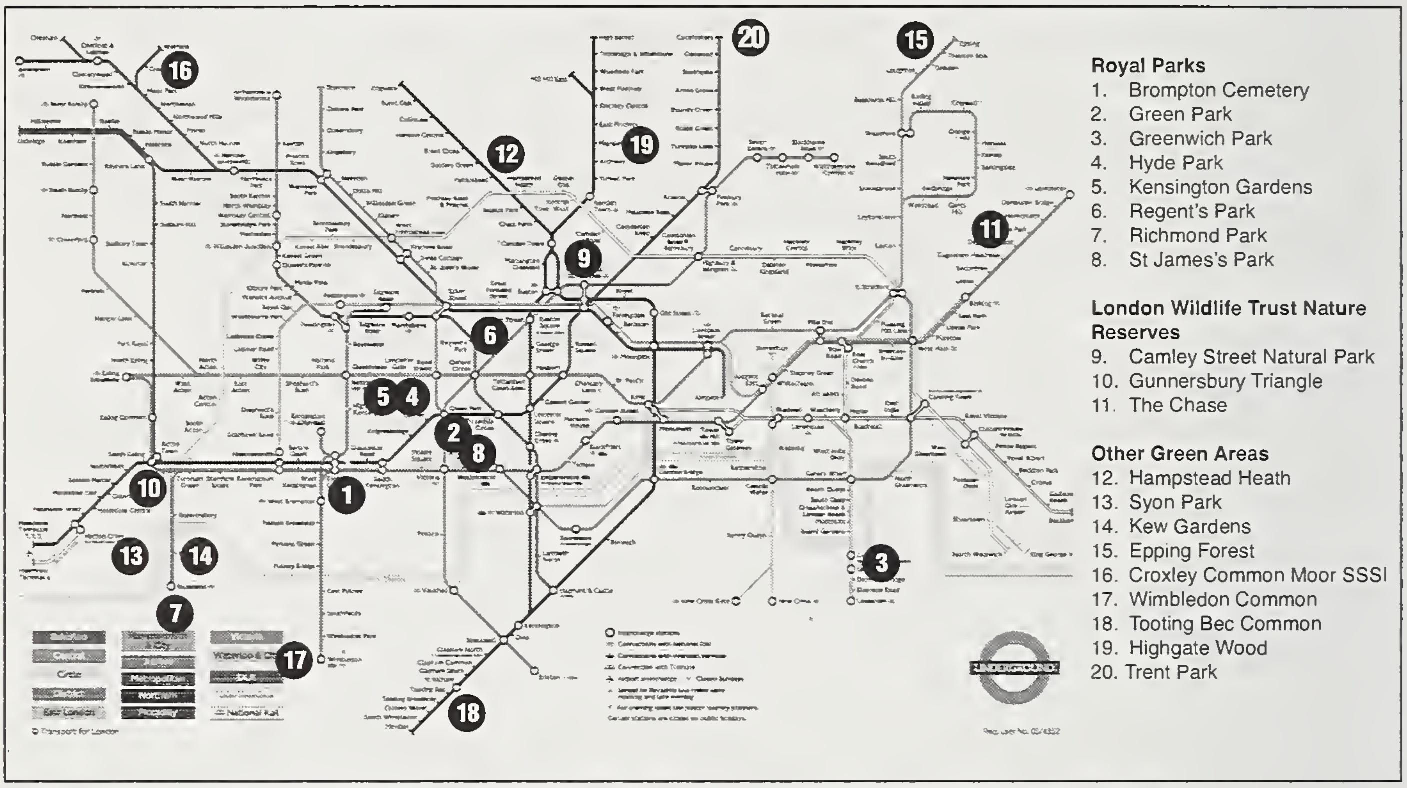

FIGURE 1. Access to green spaces within the London Underground network.

Transport for London has its own environment strategy with an objective to maintain and where possible enhance the quality of London's natural environment. This naturally reflects all the Mayor's strategy aims.

Supporting the Mayor's strategies, the London BAP and TfL's environment strategy naturally assists LU to meet its legal duty under the Natural Environment and Rural Communities Act 2006 'to have regard to conserving biodiversity in exercising their functions'.

Railway linesides, such as those along the Underground network, are recognized in the Mayor's Statutory Biodiversity Strategy as an important habitat providing 'an excellent network of green space throughout the capital and comprises a variety of habitats, chiefly woodland, scrub and rough grassland' (Figure 1).

The quality of railway habitat can be demonstrated through the fact that a hundred of the 1,900 hectares of lineside on the District, Metropolitan and Central Lines are designated as non-statutory Sites of Importance for Nature Conservation (SINC). This means that five per cent of this land has been recognized by local authorities in London, and the surrounding area, as locally valued wildlife sites.

Indeed, the biodiversity importance of LU's lineside environments varies depending upon the areas of surrounding land that they pass through. For instance, in inner London boroughs, railway linesides can provide habitats that are not present elsewhere in the borough due to the pressures of urban development. In addition, the loss of brownfield sites within London to development means that the importance of lineside habitats is increased as ecological resources elsewhere are even more limited. Brownfield habitats are now recognized as nationally important scarce habitats of exceptionally high biodiversity value. Railway linesides are therefore very important as in many cases they replicate the characteristics of this habitat type.

Living roofs may be used to create additional wildlife habitats in habitat-poor urban areas. LU already has three living roofs on operational buildings — the Stratford and Brixton Train Crew Accommodation buildings and Northern Line Control Centre (Figure 2). Another living roof, with integrated electricity-generating solar panels, has recently been installed at LU head office building at 55 Broadway in association with Buglife — The Invertebrate Conservation Trust & Livingroofs.org with funding through SITA Trust's Enriching Nature Programme. Buglife will be carrying out a three-year research project monitoring the living roof as part of research to see to what extent living roofs have helped support certain species of invertebrates.

So far, the project has shown that just within its first year, the roof is teeming with insect life, the most prolific and noticeable being pollinating insects, bees and Lepidoptera. Cornflower, oxeye daisy, camomile, corn cockle and poppies carpeted the roof. Red- and white-tailed bumblebees, as well as early and brown carder bumblebees, have all been recorded. Spiders such as money spiders, jumping spiders and crab spiders, together with some beetles, such as ladybirds, already occupy the roof habitat. 2010 has been particularly harsh on green roofs because of the frosts and snows in January, drought in April and summertime. The roof as designed and installed has really stood up to the challenges of such weather.

So far, ecological surveys undertaken in 1999 and 2005–2006 by LU and its contractors, have confirmed the overground railway linesides managed by LU as a valuable ecological resource in London. All information from these surveys is shared with Greenspace Information for Greater London (GiGL), the repository for biodiversity survey information in London. Access to GiGL data means that LU also has information about habitats bordering its property in all

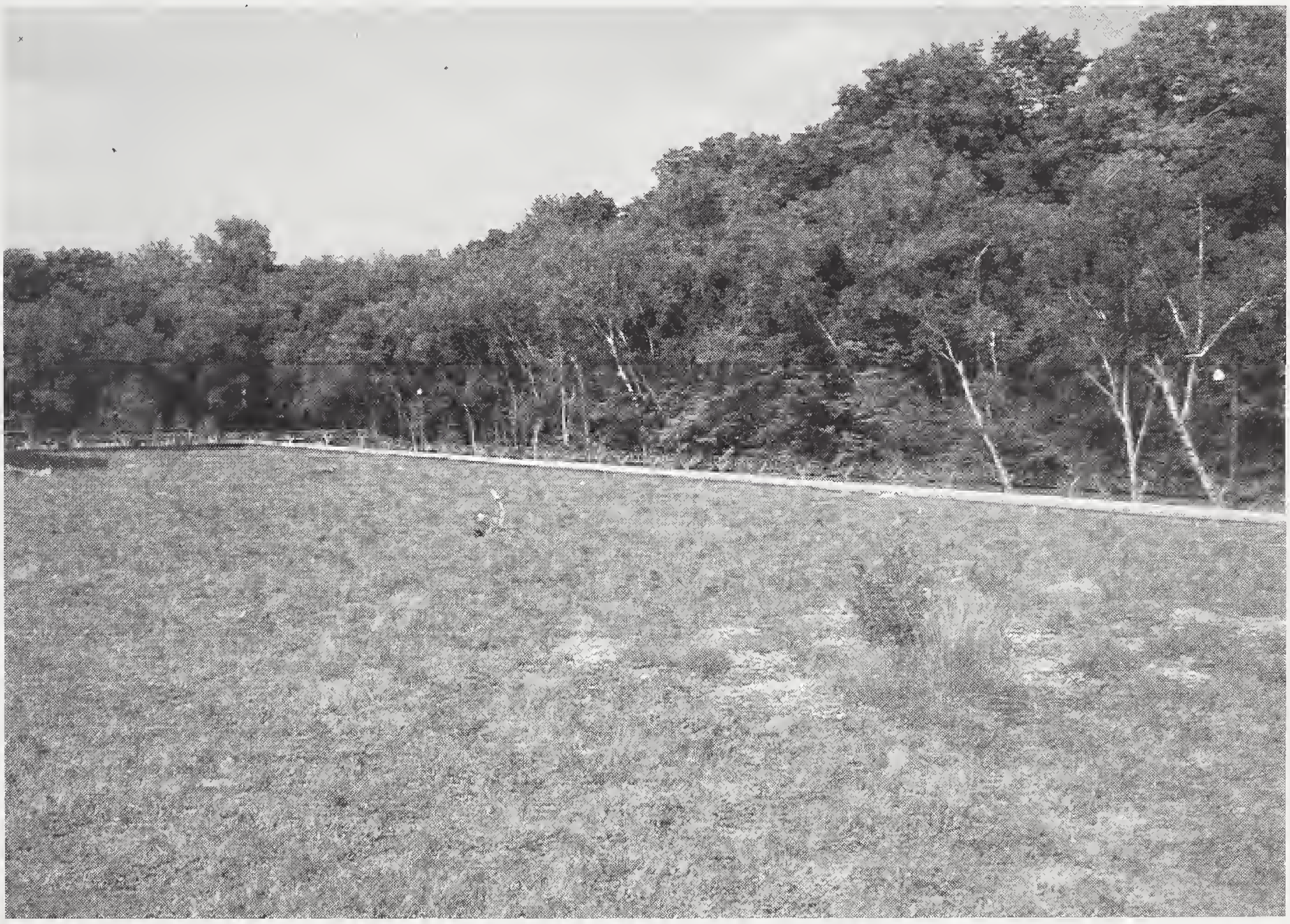

FIGURE 2. Northern Line Control Centre living roof.

London boroughs. This is essential when planning site access to and from projects.

Within LU, survey information is available to employees via the geographic information system (GIS). The GIS is an essential planning tool that enables the habitat type, quality (high, medium and low) and presence or potential presence of protected species at a particular area, to be identified. This information then guides project plans, reinstatement works and management practices in advance of works.

For safety reasons, access to operational railway land is restricted, leaving wildlife relatively undisturbed apart from maintenance activities and the passage of trains. However, as long as the safe performance of the railway is not affected in any way, lineside land can provide important secluded areas as refuges for wildlife, especially species that elsewhere may be vulnerable to human disturbance.

A wide variety of mammal, reptile, amphibian and invertebrate species was recorded on LU property during surveys. A number of these are legally protected or locally important animal species, including bats, birds, great crested newts, reptiles, stag beetles and water voles. Unfortunately, non-native pest species are also found, such as oak processionary moths and their larvae, which were introduced to Britain around the Richmond area a few years ago. Control plans developed with all stakeholders involved and the Forestry Commission are ongoing.

There are a number of protected habitats that fall adjacent to or near to the track, including sites designated as Sites of Special Scientific Interest (SSSI), sites of national importance for nature conservation, and Special Areas of Conservation (SAC) which are designated at a European level.

The Metropolitan Line crosses between Croxley Common Moor SSSI, an important Hertfordshire acid grassland and heathland area, between Moor Park and where the line splits to serve Rickmansworth and Croxley.

The Central Line runs close to, and in some areas immediately adjacent to sections of Epping Forest SSSI, which is also designated an SAC between Woodford and Buckhurst Hill and Leytonstone and Snaresbrook.

Finally, Pondsfield Park SINC, located between Dagenham Heathway and Dagenham East on the District Line, has been designated for the small areas of acid grasslands present, and Roxbourne Park SINC, located between Rayners Lane and Eastcote on the Metropolitan Line, includes both acid and neutral grasslands.

Most of the habitats on LU property are ‘semi-natural’, meaning they have not developed entirely naturally over time, and that they will have received some form of management in the past, i.e. ongoing vegetation maintenance activities, which influence habitat structure and development.

Two broad habitat types have been selected as priorities, woodland and scrub, and grassland. The amount of trackside land that is wooded has steadily increased over the last three decades, due to less tree felling and scrub clearing other than for vital operational necessity. Here LU plans to make improvements to biodiversity by redressing the balance when replanting towards grassland, a rare habitat in London compared with woodland.

Two plant species that have a negative impact on biodiversity are present on LU property — Japanese knotweed and giant hogweed. Action plans that prevent spread and reduce the number of infested sites by these invasive species naturally lead to improvements in biodiversity.

Two key elements of LU’s activities to maintain and renew the LU network have the potential to impact biodiversity, namely vegetation maintenance and project works that involve vegetation clearance. It is by making changes to these two practices that LU has the best opportunities to make improvements to lineside biodiversity.

The regular control of vegetation is essential to protect fence lines, embankments, cutting slopes and the track infrastructure from the effects of

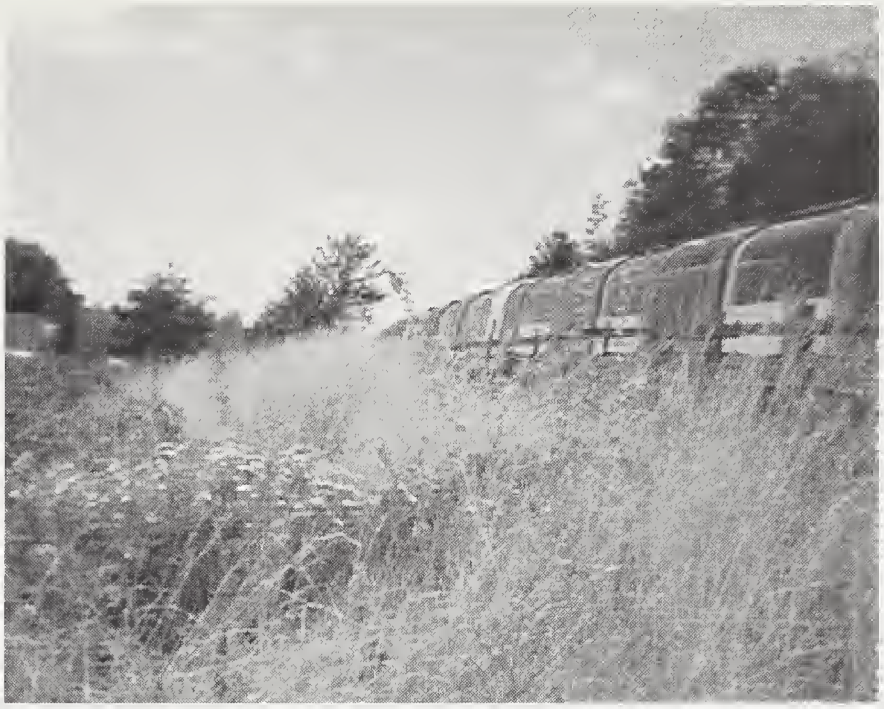

FIGURE 3. Species-rich grassland on the Central Line.

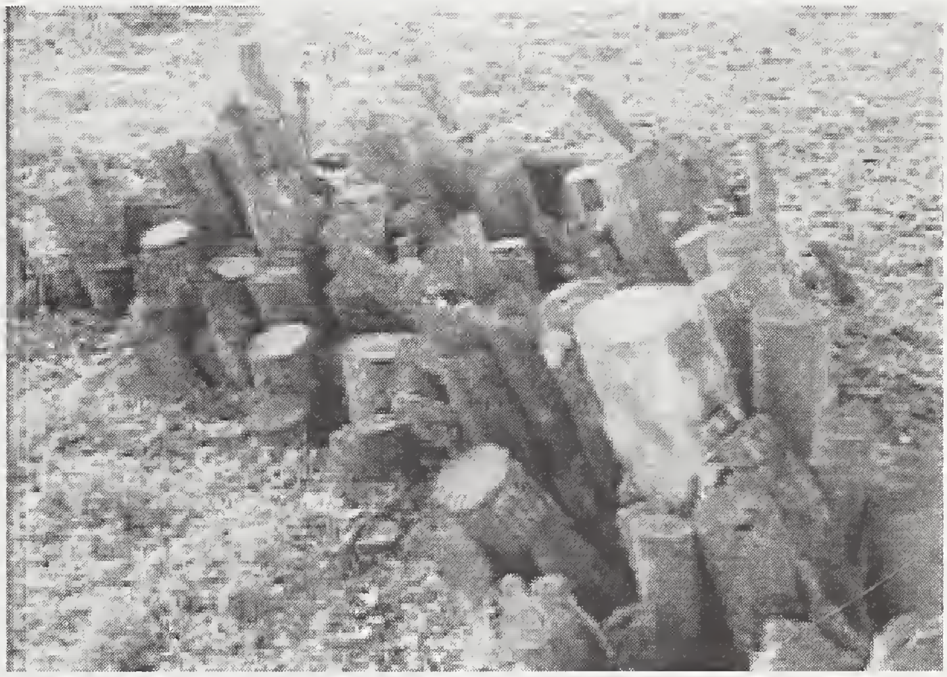

FIGURE 4. Stag beetle loggery.

encroachment by vegetation as well as to control the spread of invasive and injurious plant species. Vegetation maintenance is necessary to prevent future problems associated with the growth of vegetation that can negatively affect the efficient running of the operational railway. For example, problems can arise from leaf fall on running rails, trees and branches falling onto the track or obscuring signals, and vegetation can affect the stability of slopes in cuttings and embankments.

Project works such as embankment and cutting stabilization schemes, track renewals, drainage works, and occasionally station works, have the potential to impact upon the wildlife along the track. All works are undertaken to ensure that protected species are not affected during works. For example, when Metropolitan Line track renewal works were planned in Amersham, a badger sett was identified within the vicinity of the worksite and a licence was obtained for the works, which were carried out with an ecologist present to minimize impacts.

Following works that require the removal of significant amounts of vegetation, landscaping is undertaken. Landscaping can play an essential part in maintaining slope stability once root structures have been established and can benefit local residents who live adjacent to the track. So important is

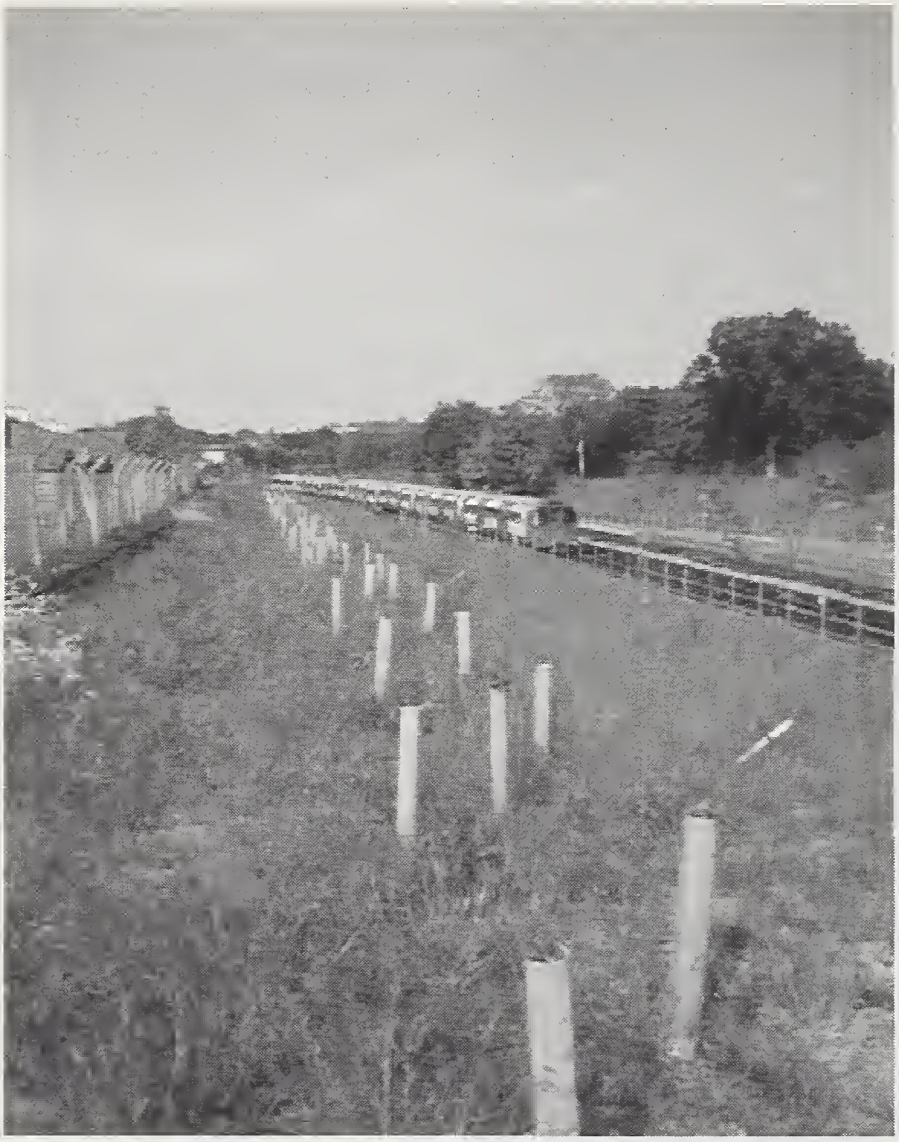

FIGURE 5. Replanted area at Kingsbury.

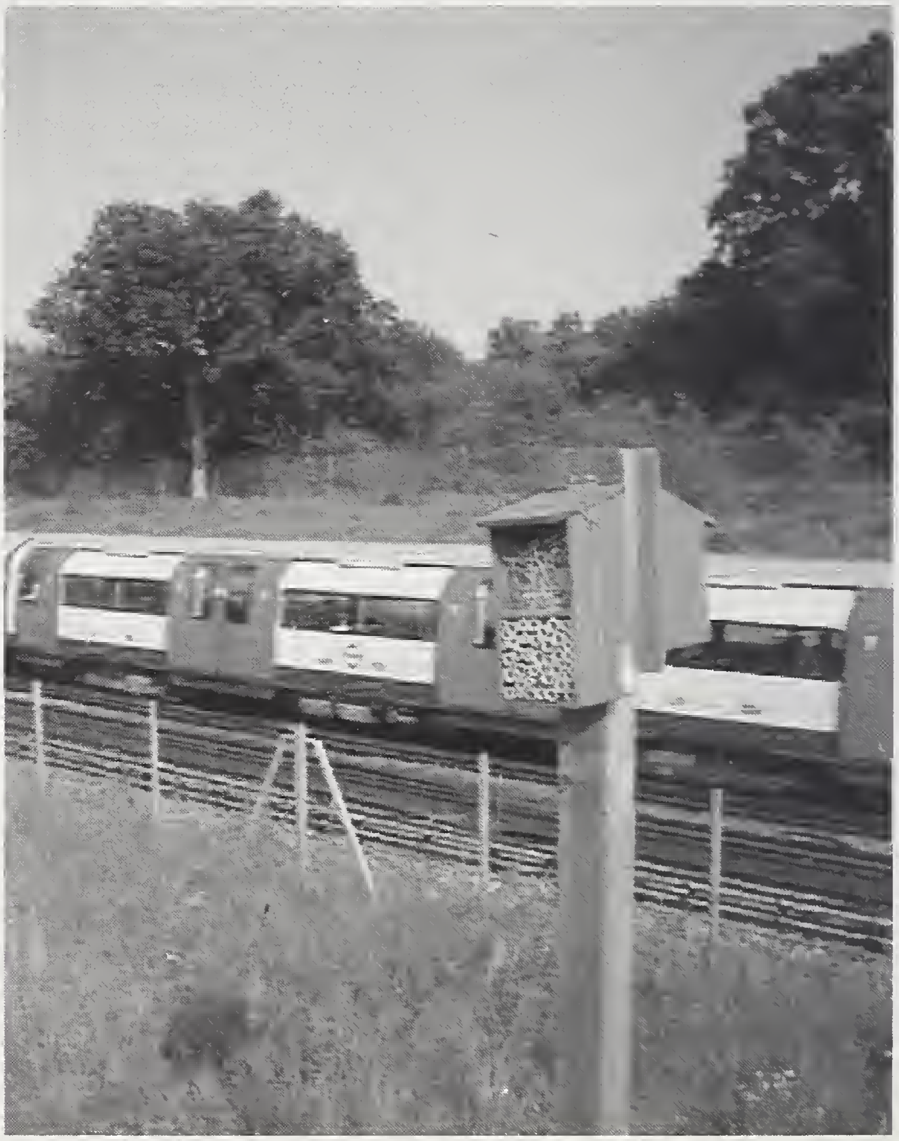

Figure 6. Beebox, Kingsbury.

landscaping to LU operations that specifications, which are applicable to all contractors undertaking any works on the network, are mandated in a Landscaping and Vegetation standard.

Landscaping and replanting also present an excellent opportunity for works to make a positive contribution towards biodiversity along the network by providing optimum habitat for fauna and flora (Figure 3 and Frontispiece). Ecologists, either from Natural England or specialist contractors, are consulted whenever creating landscaping plans; ensuring appropriate enhancement measures are put in place to encourage locally important or protected species and habitats.

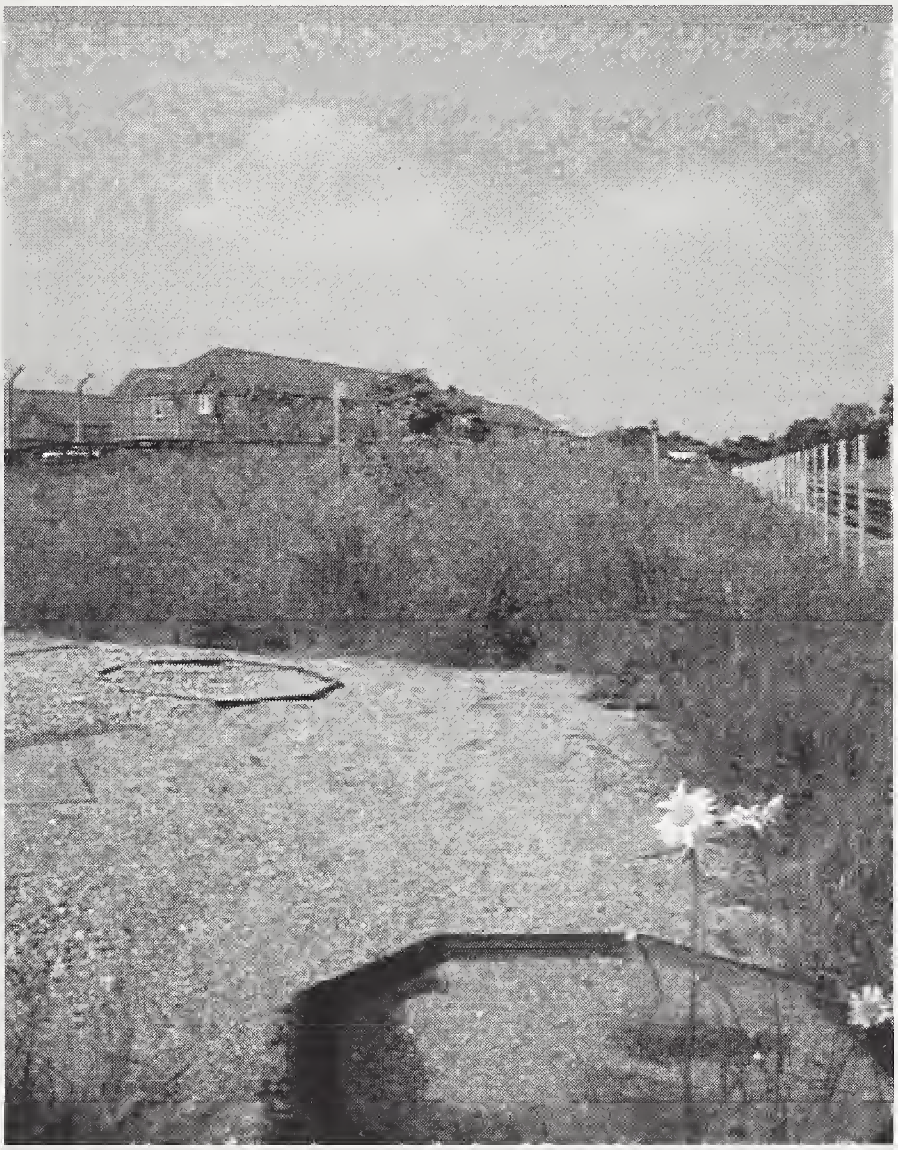

FIGURE 7. Reptile watering and basking area, Kingsbury.

In an extensive £7.5 million scheme to stabilize embankments and cutting slopes on the section of track between Hillingdon and Uxbridge stations, shared by the Metropolitan and Piccadilly Lines, a number of simple but effective biodiversity enhancement measures were implemented.

Stag beetle 'loggeries' were installed in an adjacent grassland meadow which are already are being used by the local stag beetle population (Figure 4). Great crested newt hibernacula were also created in adjacent areas to the track under a licence agreed with Natural England.

A continuous line of mature trees has been maintained throughout the works at the base of embankment slopes. Once the stabilization works are complete, the vegetation is to be re-established using a native wildflower seed mix and native shrubs to create a woodland-edge type effect, which should provide excellent habitat for invertebrates such as butterflies.

Another example is the establishment of a nature area between Kingsbury and Wembley Park (Figure 5). The site has been seeded with a variety of native

FIGURES 8, 9 and 10. Some 'Mind the Bird' competition entries.

wildflower seeds and replanted with shrubs and trees, to enable native wildlife to flourish. A number of different habitat areas have been installed, including solitary bee boxes (Figure 6), woodpecker boxes, barn owl boxes, field mouse and dormouse habitats, and hedgehog habitat. A reptile watering area, which includes an innovative reptile basking area, has also been installed (Figure 7). Logs from the site that have been felled have been stacked on-site to provide a habitat for fungi and beetles, a vital food source for birds. The embankment continues to be monitored to see what else moves into the area.

LU uses a variety of tools to manage biodiversity issues including legal compliance. At its core is the LU Environment Strategy with objectives:

- to conserve, and where reasonably practical to enhance, the biodiversity value of LU property
- to increase awareness amongst staff and the travelling public of biodiversity in London.

To fulfil its first objective LU published its first Biodiversity Action Plan in 2007. Available to the public, it outlined the biodiversity resource provided by the lines, stations, depots and sidings managed by LU. It identified the priority species and habitats, important conservation terms and explains the actions LU, and its contractors, will take to protect, conserve and enhance biodiversity within the context of upgrading and running the railway until the BAP was reviewed this year in 2010. The 2010 review aligns the LU BAP with current conservation principle of landscape-scale conservation, as well as continuing to conserve and protect the species and habitats indentified in the first BAP where possible.

LU worked closely with London-based and national conservation bodies, such as the London Biodiversity Partnership and Natural England to produce the BAP and called on their support for the 2010 update too. Natural England welcomed LU's commitment to protecting biodiversity noting that it was good news for wildlife and for the people of London.

This year the BAP is being reviewed and improved to coincide with the UN Year of Biodiversity. New strategy actions will be implemented that support current landscape-scale conservation strategies to enhance the quality of, or increase scarce habitat types in London by using Habitat Suitability Maps, developed by GiGL for the London Biodiversity Partnership, to highlight enhancement areas where they intersect LU lines. The new BAP strategy actions will run to 2016 when the next round of ecology surveys is planned to meet Mayoral Biodiversity Strategy requirements.

LU carries over one billion passengers each year which, combined with over 20,000 members of staff, means that LU can play a central role in raising awareness of biodiversity in London. To meet its second objective, LU uses internal and external publications, such as staff magazines and the *Metro* newspaper, and awareness-raising campaigns and competitions, not only to promote interest in the environment but also to promote the access the Tube provides for visiting greenspaces in London.

Various successful competitions have been run with RSPB, including the 'Mind the Bird' photographic competition in 2009 that had entry categories for both employees and public (Figures 8, 9 and 10). This year's 'Life Between the Lines' photograph and projects competition includes categories for individual employees and the public but has also been extended for community groups.

The access the Tube and the wider Transport for London network provides to greenspaces is promoted each year through the Oystercatcher Bird Race, organized by Natural England. Here teams from different organizations visit different wildlife sites and greenspaces within London, using only public transport, to spot as many bird species as possible.

Internally, the LU 'Underground in Bloom' competition becomes more and more successful every year. Over fifty locations now take part with representatives from all lines. Some unexpected surprises can turn up in station gardens, such as stag beetles and slow-worms, and entrants are encouraged to look for opportunities to encourage wildlife and also to monitor and record wildlife sightings in their gardens. London's Capital Growth scheme, which aims to add new growing spaces in London by 2012 by increasing the amount of locally grown fruit and vegetables in the city, has inspired the addition of a new Fruit and Vegetables category into the competition too.

Conclusion

The Underground provides excellent habitat resource over ground; not only for the wealth of flora and fauna able to flourish, but also for Londoners. LU has an important job to educate its employees and the public in a fun and interesting way, as well as continually to improve its land management practices so that the biodiversity of its network increases despite challenges such as climate change. Enhancing biodiversity is a vital part of being a world-class Tube for a world-class city.

The London Underground *Biodiversity Action Plan 2010 – Connecting Nature* is available via the Transport for London website www.tfl.gov.uk

Monitoring the recolonization of cleared ground at Oxted Downs, Surrey

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Abstract 47
Introduction 47
Recording 47
Appearance of the site 50
  Plant composition 50
  Boundaries 53
  Seasonal effects 53
  Comparisons and changes with time 53
  Indicator plant species 54
Discussion 57
Acknowledgements 58
References 58

Abstract

The vegetation on a site on the North Downs in Surrey which had been cleared of scrub was recorded for five years to monitor recolonization and to determine any effects on the adjacent established chalk grassland. Quantitative data can be used to compare different sites and changes through time.

Introduction

Gangers Hill (TQ376541) is part of the National Trust land at Oxted Downs, on the south-facing slope of the North Downs, in the Surrey Hills Area of Outstanding Natural Beauty. It is accessible from the North Downs Way at the top (north) of the slope and visible from the M25 motorway to the south. Most of the site is grassland on chalk, although 'grassland' is something of a misnomer, as it is a rich and colourful assemblage of low-growing (less than 10 cm) grasses, sedges, bryophytes and flowering plants. As with many parts of the North Downs, in recent years the grassland has gradually become invaded by areas of scrub. In October 2002, two sections of scrub were removed using heavy machinery, leaving two strips of entirely bare ground. The debris was shredded and moved to the bottom (south) of the slope.

Starting in August 2003, members of the Surrey Botanical Society (formerly the Surrey Flora Committee) recorded the plants growing on the cleared areas and on the established grassland. Monitoring continued in two visits each year, until August 2008. The objective was to compare the vegetation of the cleared areas with the adjacent areas of established grassland, to monitor the recolonization of the bare ground and any effects of this on the established grassland, and to develop some methods to summarize the data to put some objective measures on the changes in vegetation.

The site was fenced, and grazed by sheep in addition to the natural rabbit population. The site was mown in June each year and again later in the summer (August to October) to control seeding of the thistles which colonized the bare areas (National Trust 2005, Whiting 2003–2008). Interim reports on the progress of the project were made in the Surrey Botanical Society Newsletter (McLauchlin 2003, 2004).

Recording

The site was recorded on one day each in May and August, starting in August 2003 and ending in August 2008. Recording dates were decided in advance and included in the Surrey Botanical Society's schedule of meetings.

The original plan was to record two areas each of the remaining established grassland and the bare areas which had been cleared of scrub. However, not enough recorders were available to maintain this schedule (perhaps due to the challenging nature of the site which is steeply sloping and reached by 137 steps down from the car park), so we concentrated on one of each, designated G1 (grassy area) and C1 (cleared area).

Eighty-one recorder-days were made in eleven visits (Table 1). Thirty-two people contributed to the recording, although only eleven came to more than one meeting. The majority of the effort (forty-two recorder-days) was made by four individuals, one of whom also provided a complete set of data for a similar cleared site to the west of the original area, recorded within one week of the main recording dates. (Oxted Downs West, GW and CW).

TABLE 1. Site recording.

	C1 cleared area	**CE cleared side of boundary**	**GE grass side of boundary**	**G1 grass area**	**CW west cleared area ***	**GW west grass area ***	**Number of recorders**
Grid ref. at top of slope TQ	3753 5415	3755 5414	3755 5416	3756 5415	3734 5385	3732 5383	
17.viii.2003	×	×	×	×	×	×	19
02.v.2004	×	×	×	×	×	×	7
15.viii.2004	×			×	×	×	5
01.v.2005	×	×	×	×	×	×	10
14.viii.2005	×		×	×	×	×	7
07.v.2006	×	×	×	×	×	×	5
13.viii.2006	×	×	×	×	×	×	7
06.v.2007	×	×	×	×	×	×	7
19.viii.2007	×				×	×	3
04.v.2008	×	×			×	×	4
17.viii.2008		×	×		×		7

× = area was recorded on this date.
* CW and GW were recorded one to six days later than the main site.

Recorders worked in groups of two or three, and were encouraged to work with different partners on each occasion to minimize recording bias and share expertise.

For each set of records, the plants were recorded in ten one-metre-square quadrats, starting at the top and working southwards down the slope. Records for the grassy and cleared areas were made at a distance of more than three metres away from the boundary between them. When there were enough recorders, additional records were made along each side of the boundary (within two to three metres) to determine whether the original chalk flora would recolonize the cleared areas by spreading, or whether any new plants growing on the cleared areas would affect the composition of the original grassy areas. These are denoted CE (cleared side of the edge) and GE (grassland side of the edge).

For each quadrat, the following data were recorded:

- sward height in centimetres
- percentage of bare ground

- percentage of litter cover (loose material, mainly dead plant matter and fragments of the shredded scrub on the cleared areas)(all except August 2003)
- all plant species (bryophytes were recorded in total; grasses were recorded in total except *Brachypodium sylvaticum* false brome, which is easily recognizable even when very small, and *Thymus* thyme, which was not determined to species)
- percentage of area covered by each plant species (not reported in this paper).

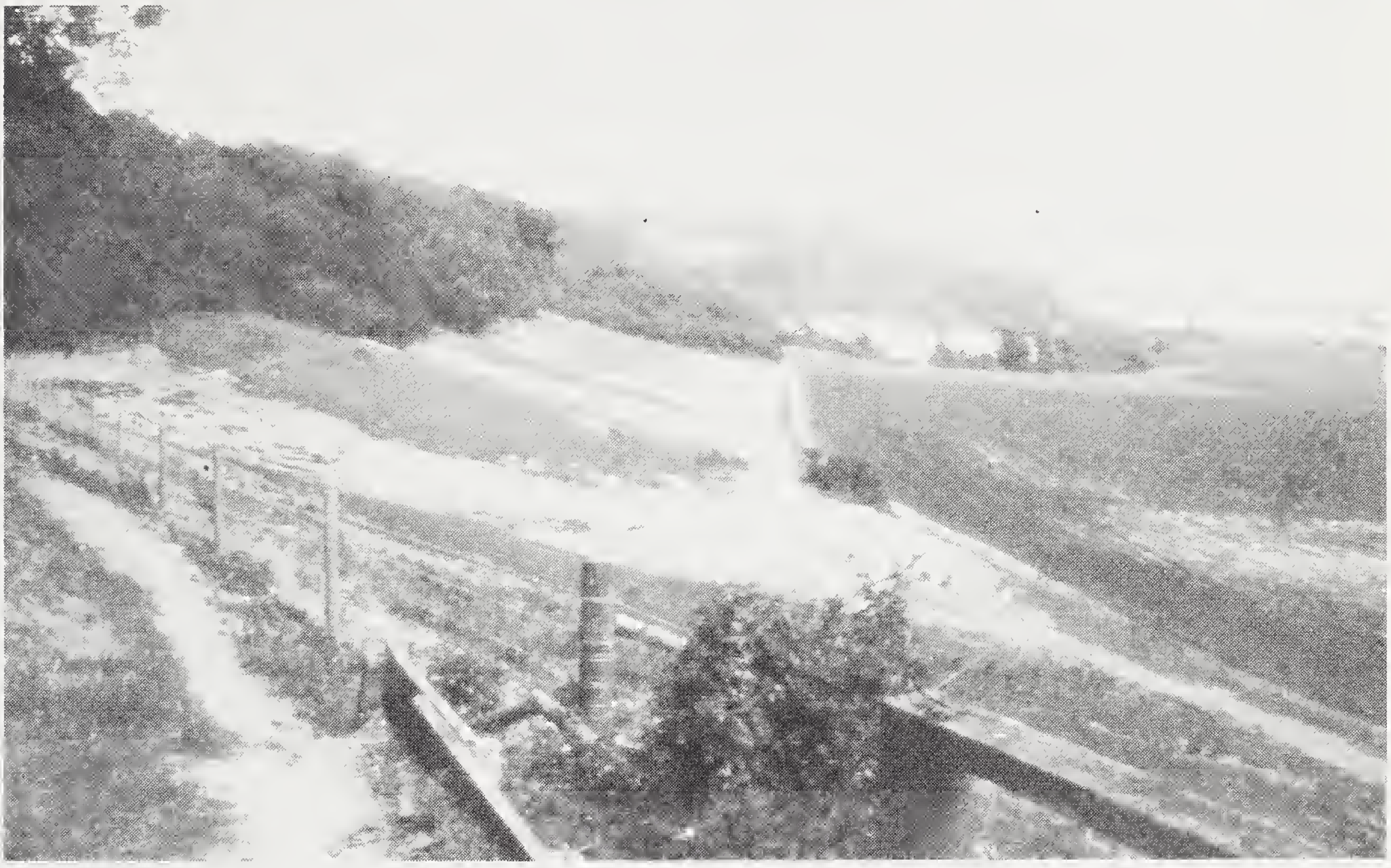


FIGURE 1. Oxted Downs, looking east, 26 June 2003, with bare patches after scrub clearance.

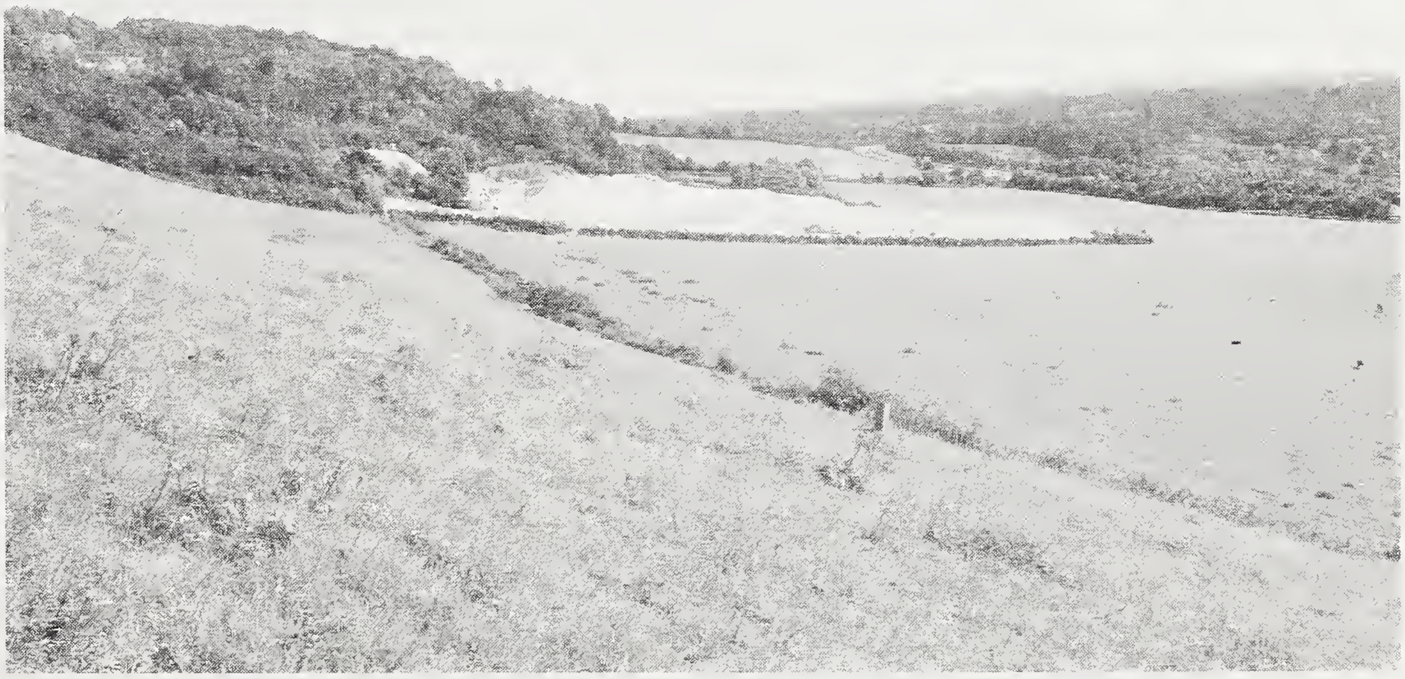


FIGURE 2. The same view in 2008, with the cleared patches green with new vegetation.

Detailed plant surveys produce large quantities of data, which give an objective measure of the status and condition of a site. Ways are needed to interpret the data to gain a picture of the results, which can be used to monitor changes in a site with time, and to compare different sites.

Appearance of the site

The appearance of the site evolved throughout the survey. When the scrub was first cleared, these areas were bare and brown (Figure 1) but they were rapidly recolonized with a strong growth of thistles, nettles and scrub, including hawthorn and bramble. The cleared areas became progressively greener in appearance, although for the first few years, from a distance could easily be distinguished as a darker green than the established grassland. By 2008 the distant view became more uniform (Figure 2), and from the M25 motorway at the bottom of the slope it has become more difficult to distinguish the established grassland and cleared areas. However, from a closer inspection the composition of plant species in the cleared areas and the established grassland remained different.

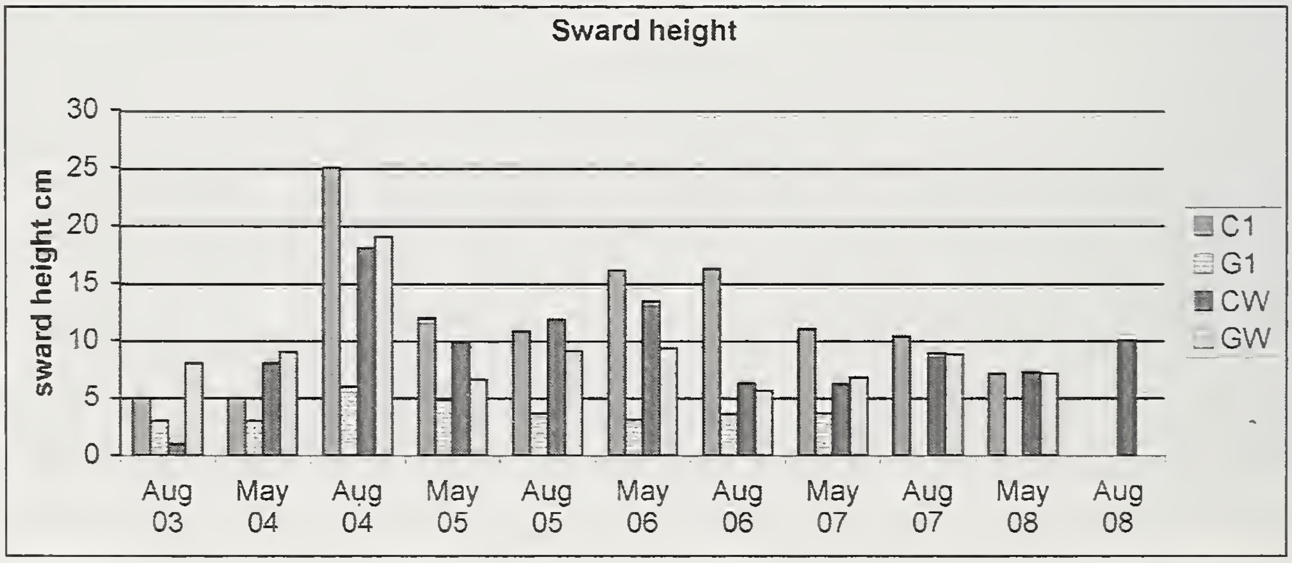
Plant composition

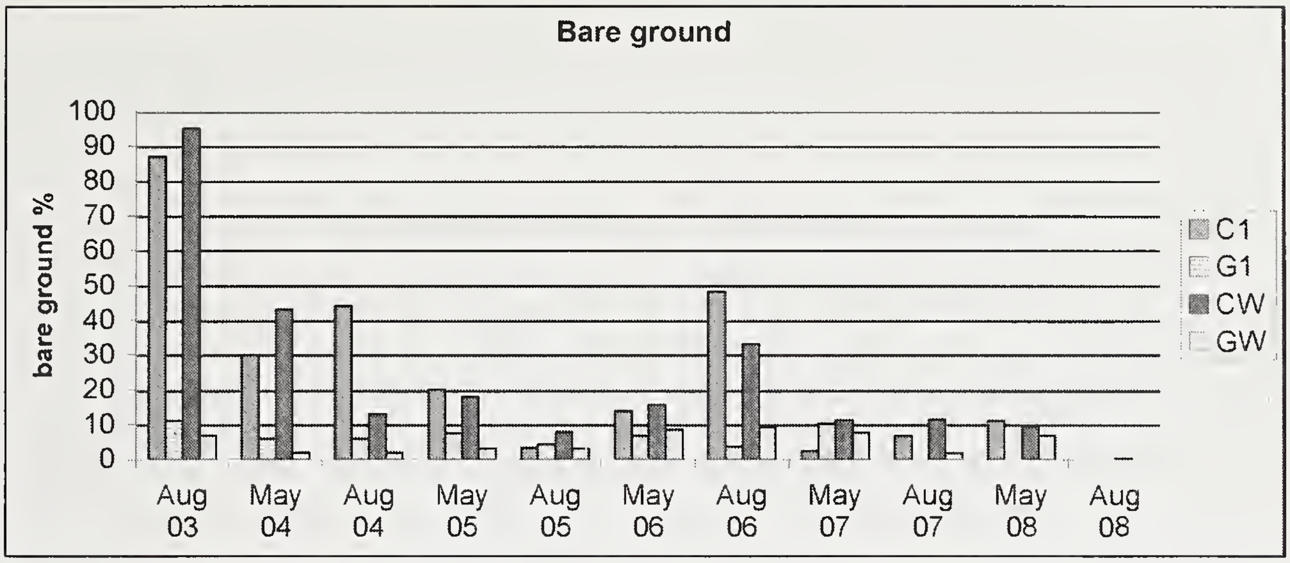
The results for sward height, bare ground and litter cover are expressed as the mean of the results for each set of ten quadrats (Figure 3). Sward height was fairly consistent for the grassy areas, and the variation is related to the weather. Summer 2004 was particularly wet and the sward in August 2004 was particularly high. The summer of 2006 was hot and dry and the sward was short. The sward on the west site GW was always taller than on G1, probably because it has more *Brachypodium sylvaticum* visible to the eye even without any more systematic sampling. Sward height on the cleared areas increased from the initial bare ground, then became taller as the ground was colonized by tall thistles and nettles, which were persistent in spite of twice-yearly mowing.

The established grassland had very little bare ground, with only small areas being created by rabbit disturbance. The cleared areas started as almost entirely bare ground, which rapidly declined as plants began to grow. The higher percentage of bare ground in both cleared areas in August 2006 is again probably a result of the dry summer.

Removal of the shredded scrub from the cleared areas was effective and left almost completely bare ground, with little remaining debris. Nevertheless, litter cover was initially higher in the cleared areas, but declined to less than ten per cent by 2007, as it decomposed or was concealed by plant growth.

FIGURE 3. Cleared and grass areas; changes with time (see text for key).




Bare ground
bare ground %
100
90
80
70
60
50
40
30
20
10
0
Aug 03
May 04
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May 07
Aug 07
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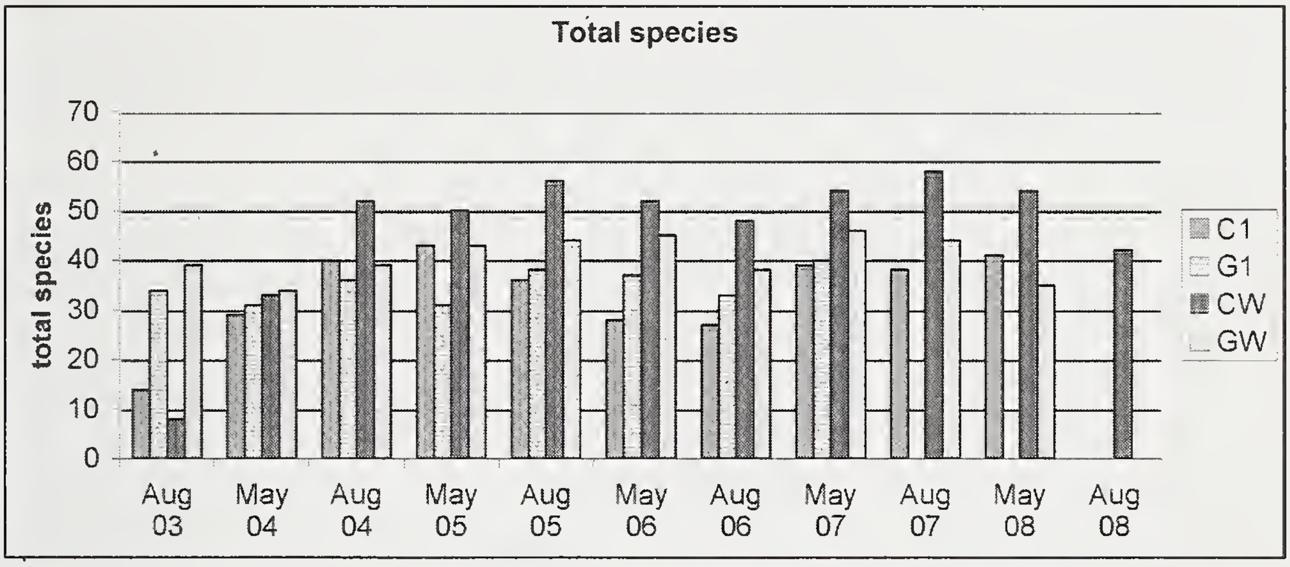
C1
G1
CW
GW


Total species
total species
70
60
50
40
30
20
10
0
Aug 03
May 04
Aug 04
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Aug 07
May 08
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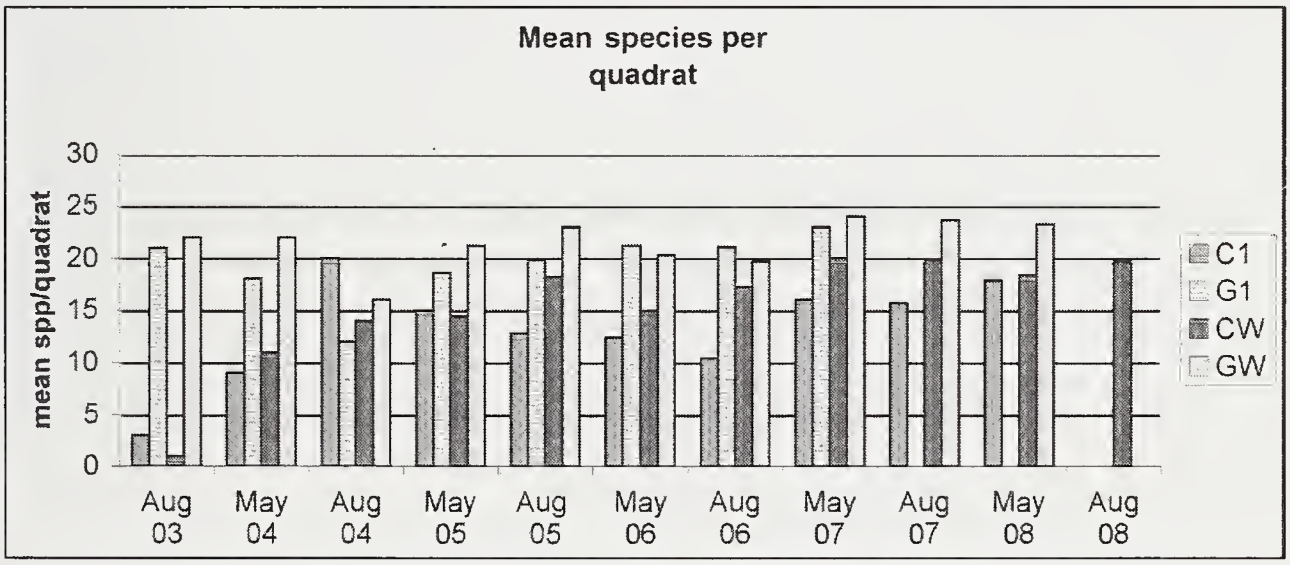
C1
G1
CW
GW


Mean species per quadrat
mean spp/quadrat
30
25
20
15
10
5
0
Aug 03
May 04
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C1
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CW
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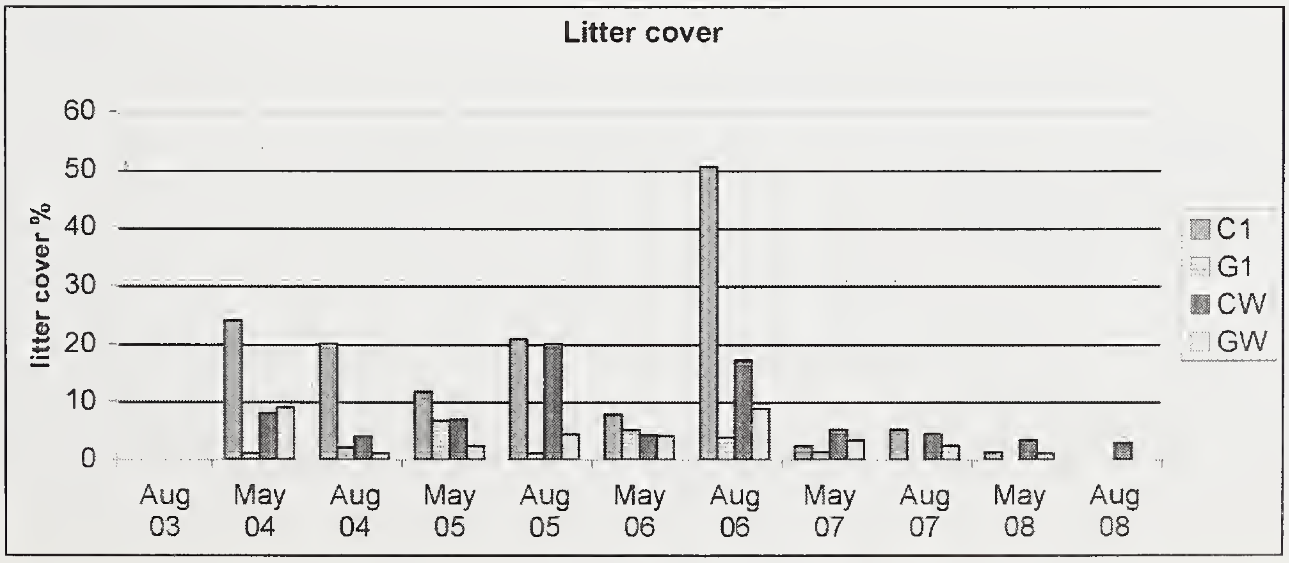
Litter cover
litter cover %
60
50
40
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10
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Aug 03
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May 08
Aug 08
C1
G1
CW
GW

A total of 101 plant species was recorded in the course of the survey (counting all bryophytes together, all grasses except *Brachypodium sylvaticum* as one, and both thyme species as one). Recording was quite challenging, as plants were often very small, regrowing after mowing and grazing, or only present as leaves.

The plant species recorded are illustrated in Figure 3 and Table 2. The total number of species is the number of different plants recorded in each set of ten quadrats. Some species were of course found in more than one quadrat but were only counted once. This measure gives an indication of diversity in each recording area sample of ten quadrats. The mean species per quadrat uses the individual species totals for each of the ten quadrats to calculate the mean and standard deviation. The standard deviation is a statistical measure of variation; sets of ten quadrats where the composition is very similar will have a low standard deviation, and sets where the results are more variable will have a larger standard deviation (the totals and means are shown in Figure 3, and Table 2 also includes the standard deviations). In a few cases there was insufficient time to record ten quadrats, and these are indicated in the table.

TABLE 2. Vegetation composition.

	C1 cleared area			**CE cleared side of boundary**			**GE grass side of boundary**			**G1 grass area**			**CW west cleared area**			**GW west grass area**		
	total	mean	sd	total	mean	sd	total	mean	sd	total	mean	sd	total	mean	sd	total	mean	sd
Aug 2003	14	3	2.7	43	11	4.0	37	21	4.2	34	21	3.4	8	1	1.1	39	22	2.4
May 2004	29	9	3.7	36	11	3.8	32	20	2.7	31	18	1.4	33	11	3.8	34*	22*	6.6*
Aug 2004	40	20	4.3							36	12	2.3	52	14	4.5	39	16	4.7
May 2005	43	15	3.6	50	24	4.0	34	20	1.6	31	19	1.9	50	14	7.9	43	21	2.0
Aug 2005	36	13	2.9				47	25	2.7	38	20	3.9	56	18	4.9	44	23	5.0
May 2006	28	12	2.6	42	23	2.3	41	22	2.6	37	21	2.5	52	15	4.6	45	20	2.1
Aug 2006	27	10	5.5	34	12	2.7	44	23	4.3	33	21	3.0	48	17	5.6	38	20	2.2
May 2007	39	16	3.3	40*	21*	2.9*	31*	21*	3.1*	40	23	3.2	54	20	6.4	46	24	2.5
Aug 2007	38	16	3.5										58	20	4.2	44	24	2.2
May 2008	41	18	3.0	49	25	2.3							54	18	6.1	35*	23*	0.6*
Aug 2008				43	23	2.3	52	33	5.3				42*	20*	4.0*			

Notes
total: number of different plant species recorded in sample.
mean: mean number of species per quadrat.
sd: standard deviation on the mean number of species per quadrat; a measure of variability between the quadrats.

All results are from sets of ten quadrats, except where indicated by *

May 2004	GW	5 quadrats	May 2008	GW	3 quadrats
May 2007	CE	6 quadrats	Aug 2008	CW	7 quadrats
May 2007	GE	6 quadrats			

For the total number of species, there was some variation in the established grassland areas, but no overall pattern or trend. The west grass area GW always had more total species than grass area G1. The species total for the cleared areas rapidly increased from initial low numbers, and by August 2004, approximately two years after the clearing, settled to no overall pattern or trend. From this time, the number of species for the cleared areas was frequently greater than that in the established grassy areas, (always for the west areas CW and GW) showing how rapidly the cleared areas were colonized with a variety of different species of plants.

However, although the total numbers of species recorded from grass areas and cleared areas was not very different, the mean species numbers per quadrat were, with one exception, always higher in the grassy areas than in the cleared areas. Also, standard deviations are generally higher for the cleared areas (particularly CW), showing that the grassy quadrats are more uniform and consistent in the composition of plants. The cleared areas are more diverse and the ten quadrats are more different from each other. These results confirm the visual appearance of the more uniform established grassland compared with the more patchy and variable vegetation on the cleared areas, where plants grow in a rather random and opportunistic manner.

Boundaries

When the scrub was first removed, the boundaries between the cleared areas and the established grass were very clear. Although the different vegetation of the cleared areas and the grass areas was still evident after five years, the precise lines of the boundaries became more difficult to determine. Table 2 shows the results for the boundary quadrats (only recorded for the boundary of C1 and G1, and not for CW and GW). Because of the variation with time, particularly for the cleared area C1, it is not clear whether the plant communities on each side of the edge remain typical of the cleared or grassy areas, or whether they are intermediate between them because of the chalk grassland community spreading into the cleared areas, or vice versa.

Seasonal effects

There were no obvious seasonal effects on any of the parameters recorded. The grassy areas were short throughout the year, being a typical established chalk grassland sward of small plants on an infertile soil and subject to grazing. Although more plants were flowering in August, their leaves were present to be recorded in May. The cleared areas were more variable, but any effect of the growth of plants during the season is not distinguishable above the effects of weather conditions and the timing of recording relative to mowing and grazing.

These results are all for the gross numbers of plant species, and after the rapid recolonization of the cleared areas during the first two years, only give an overall view of the sites. The recording method discriminates between established grass areas and cleared areas, particularly in the variability of composition of the cleared areas.

Comparisons and changes with time

Looking at the number of species recorded discriminates between grassy and cleared areas, but does not indicate which plant species are important.

To show whether the cleared areas are becoming more like the grass areas, Figure 4 illustrates how many species the cleared and the grass areas have in common. This increased with time, showing that there are more species in common. The low figures early in the survey reflect the very small total number of species growing on the bare ground at this time. The two survey areas were rather different. Although Oxted Downs West generally had higher numbers of species, the numbers in common between the grassy and cleared areas in CW and GW were higher than in the first site C1 and G1. The number of species in common is quite surprising, considering the difference in appearance even at the end of the survey, leading to the conclusion that the actual species and their abundance are also important.

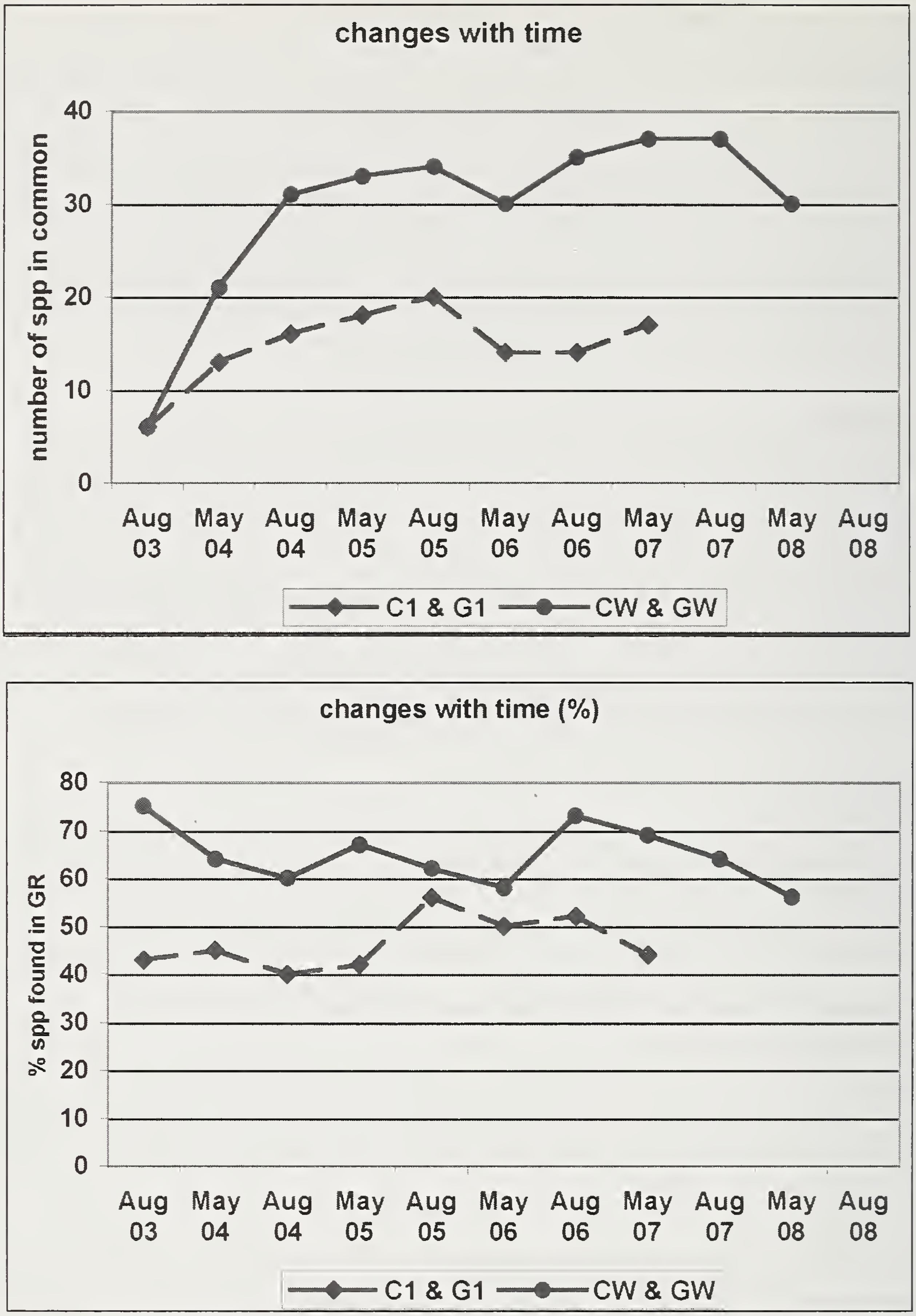

FIGURE 4. comparison of the vegetation in cleared and established grassland areas (see text for explanation).

Indicator plant species

The National Vegetation Classification set out descriptions of plant communities and their typical species (Rodwell 1992, Robertson and Jefferson 2000). Oxted Downs is calcicolous grassland CG3, *Bromus erectus* grassland (Humphreys 2004). Positive and negative indicator species, with those recorded in the current survey, are shown in Table 3. Eleven out of the twenty-two positive, and four out of the six negative indicator species were recorded in this survey.

TABLE 3. CG3 indicator species (Robertson and Jefferson 2000).

Positive indicator species		**Recorded in this survey**
Bromopsis erecta	Upright brome	
Anthyllis vulneraria	Kidney vetch	
Asperula cynanchica	Squinancywort	
Campanula glomerata	Clustered bellflower	
Cirsium acaule	Dwarf thistle	Y
Filipendula vulgaris	Dropwort	
Galium verum	Lady's bedstraw	
Gentianella spp.	Gentians	Y
Helianthemum nummularium	Rockrose	
Hippocrepis comosa	Horseshoe vetch	
Leontodon hispidus/saxatilis	Rough and lesser hawkbits	Y
Leucanthemum vulgare	Oxeye daisy	
Linum catharticum	Fairy flax	Y
Lotus corniculatus	Bird's-foot trefoil	Y
Pilosella officinarum	Mouse-ear hawkweed	Y
Plantago media	Hoary plantain	
Polygala spp.	Milkworts	Y
Primula veris	Cowslip	
Sanguisorba minor	Salad burnet	Y
Scabiosa columbaria	Small scabious	Y
Succissa pratensis	Devil's-bit scabious	Y
Thymus spp.	Thymes	Y
11 species from 22		
Negative indicator species		
Cirsium arvense	Creeping thistle	Y
Cirsium vulgare	Spear thistle	Y
Rumex crispus	Curled dock	
Rumex obtusifolius	Broad-leaved dock	
Senecio jacobaea	Ragwort	Y
Urtica dioica	Nettle	Y
4 species from 6		

Table 4 shows the location of these species, for all visits combined to each area. There is good discrimination between the grassy and cleared area in both positive and negative indicator species. There were more positive indicator species, and fewer negative species in the grassy areas, and the opposite for the cleared areas. Both the total numbers of indicator species, and the frequency of individual species (which are also calculated as the percentage of visits when they were recorded, to compensate for the unequal numbers of visits to each area) have intermediate values for the boundary samples CE and GE.

The numbers of indicator species are rather small, particularly the list of only four negative species, so the results are strongly affected by the distribution of

TABLE 4. CG3 species recorded in the survey (all visits to each area combined).

	C1	CE	GE	G1	CW	GW
Number of visits	10	8	8	8	11	10
Positive indicator species						
Cirsium acaule	1	2	7	8	10	10
Gentianella spp.	0	1	2	5	0	2
Leontodon hispidus/saxatilis	1	1	7	4	8	10
Linum catharticum	1	5	6	8	4	7
Lotus corniculatus	5	7	7	8	9	10
Pilosella officinarum	0	2	7	8	5	9
Polygala spp.	0	5	6	4	5	6
Sanguisorba minor	2	7	8	8	8	10
Scabiosa columbaria	0	0	0	0	0	1
Succissa pratensis	0	0	0	0	0	1
Thymus spp.	0	6	6	8	5	10
Total positives	**5**	**9**	**9**	**9**	**8**	**10**
Negative indicator species						
Cirsium arvense	9	8	2	0	8	1
Cirsium vulgare	4	2	1	0	3	0
Senecio jacobaea	2	4	5	4	6	4
Urtica dioica	8	1	0	0	4	0
Total negatives	**4**	**4**	**3**	**1**	**4**	**2**
	C1	CE	GE	G1	CW	GW
Number of visits	10	8	8	8	11	10
Positive indicator species						
Cirsium acaule	10	25	88	100	91	100
Gentianella spp.	0	13	25	63	0	20
Leontodon hispidus/saxatilis	10	13	88	50	73	100
Linum catharticum	10	63	75	100	36	70
Lotus corniculatus	50	88	88	100	82	100
Pilosella officinarum	0	25	88	100	45	90
Polygala spp.	0	63	75	50	45	60
Sanguisorba minor	20	88	100	100	73	100
Scabiosa columbaria	0	0	0	0	0	10
Succissa pratensis	0	0	0	0	0	10
Thymus spp.	0	75	75	100	45	100
Negative indicator species						
Cirsium arvense	90	100	25	0	73	10
Cirsium vulgare	40	25	13	0	27	0
Senecio jacobaea	20	50	63	50	55	40
Urtica dioica	80	13	0	0	36	0

each species. A longer list, similar to that of ancient woodland vascular plant species (Rose 1999) would be a useful measure, and a suggestion that this could be useful has been made (Jefferson 2008). The list for woodlands in South-east England comprises one hundred species. None of the species occurs exclusively in ancient woodland, but the number recorded provides useful descriptions of woodland sites. Table 5 lists further candidate species for chalk grassland, found only in the established grassland areas. Some of these seem rather unlikely candidates (*Cotoneaster horizontalis* wall cotoneaster for example, which is an invader on this site), but they are derived from the results. These need to be combined with results from other sites to develop a useful list.

TABLE 5. Additional candidates for a chalk grassland indicator list.

Agrimonia eupatorium	Agrimony
Blackstonia perfoliata	Yellow-wort
Bryophytes	Mosses
Carex flacca	Glaucous sedge
Cornus sanguineus	Dogwood
Cotoneaster horizontalis	Wall cotoneaster
Erigeron acer	Blue fleabane
Euphorbia amygdaloides	Wood spurge
Fragaria vesca	Wild strawberry
Hypochaeris radicata	Cat's-ear
Origanum vulgare	Marjoram
Picris hieracioides	Hawkweed oxtongue
Potentilla reptans	Creeping cinquefoil
Taraxacum officinale	Dandelion
Viburnum lantana	Wayfaring-tree
Viola hirta	Hairy violet
Viola riviniana	Common dog-violet

Discussion

Clearing the scrub adjacent to established chalk grassland has successfully re-created a green species-rich sward, although even after five years the composition of the cleared does not yet match that of the established grassland. When first cleared, the ground was totally bare, but within two years it had gained a good green appearance, which has enhanced its appearance as seen from the M25 motorway and the North Downs Way. Subsequent to the original clearing, the site has been mown annually to prevent the seeding of thistles and has been grazed by rabbits, sheep and cows, and this management has maintained a low sward height. Probably the contrast between the cleared areas and the established grassland would have been much greater if the cleared areas had been left to recolonize without these interventions.

Even after five years the composition of the cleared areas does not yet match that of the established grassland. Although the cleared areas were colonized by new growth rather than by the established grassland spreading onto the bare ground, the grassland has retained its integrity and is not being invaded by the plants which have colonized the cleared areas.

The time of year made no consistent differences to the plants recorded, which is probably due to the shared expertise of the recorders in identifying plants by their leaves. The project has had considerable benefits in increasing our expertise in identification. Although the west site (CW and GW) was recorded by one individual, she also joined the groups recording the first site (C1 and G1). If the difference in recording method affected the results, it would be expected that a group would record more plants than a single individual. However, more species were usually recorded in the west site, so the differences are likely to be real, and the recording reliable.

This report has only considered the presence of species in a quadrat. This takes no account of the size and spread of individual plants. The areas covered were estimated as part of the recording, and these will be discussed in a subsequent report.

It is intended to record the site again in 2013, to see the effects ten years after clearing, to look at the composition of the cleared areas, and of the boundaries between the cleared and grassy areas.

Acknowledgements

Thanks to the late Dr Derek Hill and Simon Humphreys, who had the idea for the project; to the thirty-two members of the Surrey Botanical Society who contributed to the recording (in particular John Dicker, Malcolm Jennings and June Wakefield who attended all or almost all the recording days); to Mark Richards of The National Trust who provided information on grazing and the management of the site, and to Howard Whiting for the Butterfly Conservation reports.

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Bur chervil reappears in Green Park

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Bur chervil *Anthriscus caucalis* (sometimes called bur parsley) is a rather inconspicuous annual plant of light sandy soils, often near the coast. It is quite common in East Anglia but, unlike its robust perennial relative cow parsley *A. sylvestris*, rather infrequent elsewhere. Records from central London are few, the most recent being Rodney Burton's of three plants in grass at Holborn Circus in 1995 (*Lond. Nat.* 75: 141). In 1961 a single plant was found in Hyde Park by David Allen who, in company with David McClintock, found it also in Green Park (*Lond. Nat.* **41**: 19). Unsurprisingly, Kent in *The historical flora of Middlesex* (1975) regarded bur chervil as a casual and not a permanent member of the county's flora.

In May 2010 I found a large colony on the east side of Green Park close to Queens' Walk. The site is in the area where a bandstand (still marked on *A–Z* maps) once stood, surrounded by a ring of thirteen mature London planes. The bandstand has gone, leaving an area of rather poor soil with a weedy flora. Around and between the plane trees are extensive patches of naturalized daffodils and other spring bulbs. Elsewhere in the Park the grass had been mowed but here the daffodil foliage was being allowed to die back before cutting, resulting in a rich growth of grasses and other plants including a few *A. sylvestris* and a much larger number of *A. caucalis*. Some were in flower, others had fruited and bore the small fruit with hooked hairs that give bur chervil its name. There were more plants in barer ground within the ring of trees — these tended to be smaller than those growing amongst, and partially supported by, the lush vegetation around the daffodils. The total number of plants was hard to estimate but was several hundred, possibly as many as a thousand, within the circle of plane trees. Searches elsewhere in Green Park failed to turn up any more bur chervil.

Are these plants descendents of those seen in 1961? Were they, perhaps, an unintentional import along with the spring bulbs? It seems unlikely they have been there for many years, given the number of expert botanists among our members who scrutinize the Royal Parks. But, after the hard and late winter of 2009–2010, their flowering and fruiting period coincided with that of the daffodils among which they grow, allowing time for ample seed production and opportunities to germinate in a highly disturbed site. Under the present management regime there seems a good chance that bur chervil will become an established part of the flora of Green Park.

Book review

Art of the New Naturalists — forms from nature. Peter Marren and Robert Gillmor. Collins, London. 2009. 310 pp. Large quarto, £60. ISBN 978 0 00 728471 9.

To quote from the Introduction, 'The New Naturalist Library is a publishing phenomenon. It started during World War II (like National Parks and nature conservation planning) and rolled on unstoppably, decade after decade, far beyond the plans or expectations.'

But this review is not about the main series of books, which as I write numbers 112 titles plus twenty-two now-discontinued Monographs. The story of the New Naturalist Library can be found in Peter Marren's *The New Naturalists* (No. 82 of the series, second edition, 2005), and there must be very few naturalists who don't possess a good run of the series; indeed, many are proud that they have the entire run, including the Monographs. This is about the artwork of the dust jackets, although to call them dust jackets is dismissive and does not do them justice. They are a publishing phenomenon in their own right.

The first of the New Naturalists, *Butterflies,* by E. B. Ford, was published in 1945, and its jacket is regarded by some as one of the best-known images on the world of natural history publishing. It was the work of the husband-and-wife team of Clifford and Rosemary Ellis, who, in the 1930s, had had their artwork published by such leading institutions as the Empire Marketing Board, Shell-Mex and BP, the London Passenger Transport Board, the Post Office, and Lyon's Corner Houses. The Ellises' jackets appeared on seventy New Naturalists, from *Butterflies* to *The natural history of Orkney* (1985), as well as on the twenty-two titles in the Monographs series, from *The badger* (1948) to *The mole* (1971).

Clifford Ellis died in 1985 and Rosemary decided she could not carry on with the series. It was Crispin Fisher, then series editor and son of James Fisher, one of the original New Naturalist Board, who asked leading bird and wildlife artist Robert Gillmor to 'take over the mantle of the Ellises' and 'become the designer of the jackets of all future New Naturalist titles which we publish, until further notice'. Gillmor was 'both thrilled and appalled', but 'Crispin was adamant', and before Gillmor could properly reply 'yes', Fisher informed him that 'The first jacket we need is already urgent.' This was New Naturalist No. 71 *British warblers* (1985), and to date Robert Gillmor has completed forty-two jackets.

It had long been common practice for some libraries and other institutions to discard dust jackets, or perhaps just keep the informative end flaps and paste them into the books. Dust jackets would tear easily when left on books in libraries, and leaving the jackets on would mean the catalogue or press marks needed to be affixed to both the jacket and the spine of the book. Some, however, did take the trouble to laminate the jacket onto the cover. I deeply regret that I destroyed the dust jackets of some of my early volumes, including *Butterflies*! Nowadays, New Naturalists with intact dust jackets fetch a far higher price on the second-hand market than those without. One disadvantage of removing the jacket is that when over the years the green buckram binding fades, the gold lettering on the spine also fades.

The present volume is, apart from its almost A4 page size, completely different in appearance from the NN and Monographs series: the covers and spine show a selection of thirty-one of the main series covers in miniature, whilst the title of the book does not appear on the front cover or spine, but on a ten-centimetre-wide blue loose wrap-around glossy band — and it looks good.

This tome is already becoming one of my most-thumbed accessions, and when I think that until now, much as I liked them, I had not given that much thought to the dust jacket designs. But now we have this book, and with the then good fortune of choice of Clifford and Rosemary Ellis, and now Robert Gillmor, to design and produce the dust jackets, I feel extremely satisfied, especially as the first volume appeared in the same year that my interest in natural history was kindled.

Since writing the above, I have purchased from a small second-hand bookshop in Cambridge a copy of *Butterflies* with its good original dust jacket for just £6!

K. H. Hyatt

Spider records in 2008 and 2009 for the London Area; and concern about a misleading article in the national press

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Abstract

Spider records in 2008 and 2009 for the London Area are detailed. The two years were very similar and altogether there was one new record for Middlesex and one for the county of London. Also, a brief account is given of a misleading article about spiders which appeared in *The Independent*.

Introduction

These have been rather poor years for spiders, with scarcer species not seen and only a handful of interesting records. The total numbers of species recorded were only 142 in 2008 and 141 in 2009 (compared with 192, 211 and 153 in the three years 2005–2007), partly reflecting the reduced number of pitfall-trapping sites maintained by the author in these years. Trapping did continue at Greenwich Park, Mile End Park, Tower Hamlets Cemetery Park and, starting in April 2009, at Coldfall Wood.

In the account below, all the records not otherwise credited are by the author. Nomenclature and the order of families are according to Harvey et al. (2002).

Spider activities in 2008 and 2009

The Society's winter foray in December 2007 to Brent River Meadows and nearby canal bank on 25 November 2007 (and not reported in *LN* **87**) was, as usual for winter forays, cold but successful in revealing a number of winter-active species some of which, like *Centromerita bicolor,* are not seen at other times of year. The most spectacular find was a colony of the beautiful green spider *Nigma walckenaeri* on a large ivy bush by the Grand Union Canal.

The summer forays in 2008 were much more productive than in 2007 when several had to be cancelled due to the wet weather, but the diversity of spiders found was disappointing. I wonder if this is in any way due to the bad summer in the previous year?

The main summer foray was at Coldfall Wood on 18 May, a beautiful late spring day. Concentrating on the extensive newly recoppiced area along the stream thirty-five species were found including a scarce inhabitant of oak bark *Meioneta innotabilis,* previously only recorded in the London Area from Queen's Wood (Middlesex) and Richmond Park (Surrey). Males of the woodland wolf spider *Pardosa saltans* were seen and photographed signalling to the females in their characteristic 'semaphore' poses.

The annual foray at Mile End Park on 24 May attracted over thirty people including about eight children. As usual the Mile End jumping spider *Macaroeris nidicolens* was beaten off the pine trees, and other interesting species found included *Zodarion italicum* — a fairly new arrival in Britain, which has so far only been found in London on sites next to railways.

A foray to Mitcham Common on 27 July was uncomfortably hot. The group were permitted access to the golf course roughs and twenty-three species were collected including the attractively marked orb-web spider *Neoscona adianta.* Perhaps the most interesting find was a parasite on a tangle web spider, *Theridion varians*, identified by Mark Shaw as *Zatypota percontataria* (a tiny ichneumonid wasp) (Fitton et al. 1986).

The summer foray with the Hampstead Heath Study Group took place on the following day, 28 July (rearranged from 2 June which was too wet). It was a very hot day and few spiders at all were found — just one or two specimens of eight common species. At Middlesex Filter Beds the same afternoon, while taking part in a documentary film about the wildlife of the Hackney Marshes, the author found some webs of *Steatoda grossa* on the wall overlooking the canal. This is a scarce species in London which has only appeared in the last year or two; there are records from Uxbridge (inside the Load of Hay public house, found by Phil Taylor), West Ham Park and Crouch End.

A foray at Tower Hamlets Cemetery Park on the 20 September attracted about forty people including more than a dozen children (possible future members!) many of whom had attended the same event in 2007 and also the Mile End Park foray in May. Altogether twenty-six species were found including the tiny jumping spider *Talavera aequipes* and a specimen of one of the larger money spiders, *Megalepthyphantes nebulosus* — a species which had been recorded a few times in London but not since 1991. Subsequently, two further specimens were trapped at Greenwich Park. Also trapped at Greenwich Park were two Nationally Notable A species, *Meioneta simplicitarsis* (see below), and a single female of *Bianor aurocinctus,* a rare jumping spider.

The wasp spider *Argiope bruennichi* was apparently much scarcer in both 2008 and 2009 than in the past few years, but this may be due to under-recording now that the spider is no longer such a novelty and members of the general public are familiar with it. The only specimens seen by the author in 2008 were at Tower Hamlets Cemetery Park and Greenwich Park.

In the 2008/9 year the first foray was on 27 November 2008, when a small party of hardy souls visited three closed sites near Heathrow Airport owned by British Airports Authority. Altogether twenty-three species were collected including a male *Clubiona subtilis* at Camp 4, and both *Centromerus dilutus* and a jumping spider *Euophrys lanigera* at Mayfield Farm. The last two were hiding in the gravel surrounding the main holding pond (for polluted runoff water from the airport).

The Society's main summer foray on 14 June 2009 to Brent River Meadows disappointingly produced only fifteen species although this did include a female *Philodromus albidus* (Notable B). Other forays included Mitcham Common on 15 May, and the usual annual forays at Tower Hamlets Cemetery Park, and at Mile End Park where once again the Mile End jumping spider *Macaroeris nidicoens* was swept from the pines. On 20 September 2009 the Society's foray to the Welsh Harp produced an excellent catch of forty species including a tiny *Clubiona subtilis* female and a single wasp spider *A. bruennichi.*

Pitfall trapping continued at Queen's Wood, Mile End Park and Tower Hamlets Cemetery, while trapping was done for twelve months at Greenwich Park, and since April 2009 at Coldfall Wood, the latter including several sites in the newly recoppiced area.

New and interesting spider records for 2008 and 2009

New county records are marked * for London and ** for Middlesex.

LINYPHIIDAE

*Meioneta simplicitarsis**. A single male specimen of this Nationally Notable A species was trapped in grassland at Greenwich Park in July 2008.

Drapetisca socialis. There are few records for this money spider in London, but on a visit to Highgate Cemetery in October 2009 several specimens of both sexes were found, and a single male was trapped at Coldfall Wood in the same month.

ARANEIDAE

Hypsosinga pygmaea. A few individual females of this scarce orb-web spider were found in long grass at Greenwich Park in October 2008, and at Mile End Park in April 2008 and March 2009.

DICTYNIDAE

Cicurina cicur. Single males of this scarce spider were trapped at Mile End Park in January 2008, and in January 2008 and December 2009 at Tower Hamlets Cemetery Park.

GNAPHOSIDAE

Haplodrassus signifer. The only previous records for this species in the London Area were occasional specimens from Blackheath and Mile End Park, but during the pitfall-trapping in 2008 it was found to be common throughout the grassland in Greenwich Park.

*Trachyzelotes pedestris***. In May 2009, Phil Taylor collected a single female at Harefield Place Nature Reserve. It was found in a silk cell under a flat stone in grassland. This is the first record of this scarce Nationally Notable B species from Middlesex, although it has been found by the author in grassland at Upminster (Essex), High Elms (Bromley, Kent), and in woodland at Hainault Forest Lodge and Claybury Wood (both Essex).

Misleading press report

An extraordinary article of a rather alarmist nature was published in *The Independent* on 15 October 2008, headed '*Alien invasion: non-indigenous spiders thriving across Britain*'. In fact, most of the species referred to have been here for at least fifty years. *Steatoda paykulliana* which, the article claimed, had 'established colonies in Plymouth', has actually been found only as a single (dead) specimen thought to have emerged from a bunch of imported grapes. The burden of the article was quite misleading if not downright wrong, suggesting that we were suffering from an invasion of alien spiders, when in fact what is more remarkable is that so few alien spiders have become established. All new records should be verified from the examination of actual specimens; unfortunately, scare stories often seem to arise based on unsubstantiated claims or just photographs which are not adequate for conclusive identifications.

Acknowledgements

I would like to thank Dr Peter Merrett and Peter Harvey for identifying some of the specimens referred to.

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Book review

Where to watch birds. Kent, Surrey and Sussex. Don Taylor, Jeffery Wheatley and Paul James. Christopher Helm/A & C Black, London. 2009. Ed. 5. 432 pp., paperback, £18.99. ISBN 978 1 4081 05856.

This popular guide was first published no less than twenty-three years ago and is now in its fifth edition. The general format will be familiar to many readers. For each site there is an account of the habitat, a narrative description of the birds to be expected by season (plus, quite often, a mouth-watering list of rarities that have occurred), details of access, including a map, and a 'calendar' — a list of the more interesting species to be expected by season. Unlike previous editions, all sites are treated in the same way, rather than a more limited coverage of the less important sites, though necessarily the amount of space given to major sites is much greater than to those of less interest. An innovation is to group sites into 'clusters' within a defined area. This leads to my only serious criticism of the book, for there is no overall map of a county to show the whereabouts of a cluster (how many people would know just where 'The Weald' cluster was as distinct from the 'Wealden Greensand' cluster?). Each account of the sites within a cluster starts with a map of that cluster, but without any cross reference to the page where each site is dealt with. The result is that it is impossible to navigate the book by reference to the maps. You have to know the name of the site you are interested in and look it up in the index or search for it in the table of contents. Details are given of 68 sites in Kent, 43 in Surrey and 48 in Sussex — 159 in all and more than in the previous edition. The coverage for Surrey extends into Metropolitan London up to the former Surrey Docks and thus includes sites such as Beddington Sewage Farm and Dulwich Woods. No similar information is given about Kent, which appears to cover only the area covered by the Kent Ornithological Society. A list of useful addresses and websites is included. Wherever possible, information is given on access for those with disabilities.

A successful guide of this nature needs to be easy to use, accurate, up to date and comprehensive. With the exception of my grumble above, this volume generally scores highly. Both the habitat and species sections are well and interestingly written and are not rigidly limited to birds; there are often comments about interesting flowers or animals that might be seen. For the districts with which I am most familiar, the coverage seems complete. The access information, including the accompanying maps, is excellent and very clear. Testing the species information for sites I know well, it is comprehensive and usually up to date, though in the case of Limpsfield Chart, a minor site, the list of species is several years out of date.

I have watched birds in the area covered by this book all my life, but I still learned quite a lot from it. So is this book worth buying, especially if you have one of the earlier editions? For a paperback, with no coloured illustrations, the price is steep, but for anyone interested in birding in these counties, it still represents a good investment, even if you have an earlier edition. For a visiting birder or anyone else unfamiliar with the area, it is essential if the object is to identify the best birding spots as quickly as possible.

PETER OLIVER

London butterfly monitoring report for 2009

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Abstract 65
Introduction 65
Methods 65
Results 66
Discussion 74
Acknowledgements 75
References 75

Abstract

Butterflies were monitored at twenty-six sites in London during 2009 by the transect walks method. Collated indices for species were calculated using the data in comparison with previous years. Species accounts were supplemented by records from other surveys and observations. The painted lady *Vanessa cardui* migration of 2009 was the largest of recent years.

Introduction

Monitoring of butterflies was undertaken by a standard method at sites in London in 2009. These provided data for the calculation of collated indices of changes in the abundance of butterfly species in London as compared with previous years. London is defined for the purposes of this paper as Greater London or the area encompassed by the London boroughs. Additional records from the wider London Natural History Society (LNHS) recording area were noted and/or made available to other regional and national recording systems.

Methods

Monitoring was undertaken by the transect walk method, a standard method adopted throughout the United Kingdom. Details of the method are described elsewhere: see Pollard and Yates (1993), Williams (2000), and the UK Butterfly Monitoring Scheme at www.ukbms.org. Basically, at each site a walk was undertaken along the same route, each week from April to September inclusive, within a standard range of weather conditions conducive to butterfly flight. Counts were made of the number of adult butterflies observed to provide a total for each species for the year at each transect. Totals used for this paper include calculated estimates for weeks missed due to poor weather or the unavailability of the recorders. However, for inclusion in the index, data from each transect required good coverage during the recording season and with the minimum of missed weeks. To contribute to the indices, data from each transect must be available for at least two years, though these do not need to be consecutive. Collated indices were calculated from the data as described by Williams (2000), but see also Crawford (1991) for an introduction to the use of collated indices in wildlife monitoring; and also Pollard and Yates (1993) and Roy and Rothery (2002). Note that neither the original site counts nor the collated indices are absolute counts of the population, but indices of abundance for each species. Estimates of the relative changes in the populations of each species from year to year are given by the difference in the indices. For example, a species with an index of 50 in one year and 25 in the following year would have had approximately half the adult population in the second year as compared with the first year. Indices have been rounded to the nearest whole number and have usually been set at 100 in 1990 or the first year of record: for a technical discussion see Crawford (1991). Reliability of indices increases with the number of transects; in the earlier years these were relatively few, e.g. one transect was walked in 1978, two in 1986, three in 1988 and eight in 1990. Reliability of the indices may be lower for species with low counts and/or local distribution in London. The 'Total count on transects' provides an indication of the size of the count from which the analysis was made in 2009 using the data from the complete transects for that species, including estimated counts for missing weeks; but excluding the computed estimated counts for transects that were not walked or had insufficient data in 2009.

Transects that contributed data in 2009, the years for which data were available and the borough in which the transect was located were: **Hampstead Heath** (Camden) 1978–2009, **Fryent Country Park** (Brent) 1986–2009, **Beane Hill** (Brent) 1988–2009, **Gutteridge Wood** (Hillingdon) 1990–2009; four transects managed by the Corporation of London (located in the London Borough of Croydon): **Coulsdon Common** 1990–2009, **Farthing Downs** 1990–2009, **Kenley Common** 1990–2009, **Riddlesdown** 1990–2009; **Mitcham Common 'route A'** (Merton) 1994–2001, 2003–2009, **Mitcham Common 'route B'** (Merton) 1995–2009, **Wildfowl and Wetlands Trust Wetland Centre at Barn Elms** (Richmond upon Thames) (Figures 1 and 2) 1996–2009, **Railway Fields** (Haringey) 1997–2009, **Hutchinson's Bank Nature Reserve** (Croydon) 1997–2009, **Cranford Park** (Hounslow) 1997–2005, 2009, **South Norwood Country Park** (Croydon/Bromley) 1998–2009, **Tower Hamlets Cemetery Park** (Tower Hamlets) 1999–2009, **Gunnersbury Triangle** (Hounslow) 1999–2009, **Brent Reservoir** (Barnet/Brent) 2000–2009, **Regent's Canal towpath from Mile End Road to Mare Street** (Tower Hamlets/Hackney) 2001–2009, **Riddlesdown Quarry** (Croydon) 2001–2005, 2008–2009, **Kenwood Estate** (Camden) 2005–2009, **Horsenden Hill East** (Ealing) 2005–2009, **Horsenden Hill West** (Ealing) 2005–2009, **Perivale Wood** (Ealing) 2005–2009, **Farthing Downs New Hill** (Croydon) 2005–2009, and **Spring Park** (Croydon/Bromley) 2001–2006, 2009. Recorders for 2009 are listed in the Acknowledgements. For some sites, the indices have been updated with data from earlier years that was not available previously.

Records from other transects and LNHS observations have been included in the species accounts where appropriate. The Chapel Bank (Croydon) transect had too many missing weeks for inclusion in the 2009 indices. Transect data from Camley Street Natural Park (Camden) are available to be included in the indices when data for a second year are available. Transects beyond Greater London but within the LNHS area are not included in these collated indices.

The London transects contribute towards the national indices of the UK Butterfly Monitoring Scheme, and for results up to 2008, refer to Botham et al. (2009). Records also contribute towards the databases maintained for the wider LNHS area, for which reference should be made to the respective county reports produced by Butterfly Conservation (e.g. Murray and Wood 2009) and other teams.

Results

The order and nomenclature of the species accounts follow Asher et al. (2001). The accounts are based on the collated indices which commenced in 1978, and which for the years 1999 to 2009 are presented in Table 1. As some year-to-year variations are to be expected the comments are focused on the more pronounced changes and on longer-term trends.

SMALL SKIPPER *Thymelicus sylvestris* and ESSEX SKIPPER *Thymelicus lineola*

Small and Essex skippers are often counted together by transect walkers due to the difficulty of separating these species in flight. They are species of rough grassland habitats. At ten transects attempts were made to identify some individuals to the two species separately. Of 165 skippers, 66 per cent (109) were identified as small skippers, and 34 per cent (56) as Essex skippers. Total count on transects: 1,604.

LARGE SKIPPER *Ochlodes sylvanus*

The index recovered from that of 2008. The large skipper is a species of grassland with scrub. Total count on transects: 444.

DINGY SKIPPER *Erynnis tages*

The majority of the records were from Hutchinson's Bank Nature Reserve and it was also recorded at Chapel Bank and at Riddlesdown. Total count on transects: 27.

GRIZZLED SKIPPER *Pyrgus malvae*

The grizzled skipper was recorded at Hutchinson's Bank Nature Reserve with a count and an index that was the highest since 1997 when the transect commenced. There were also records from Chapel Bank. Total count on transects: 28.

CLOUDED YELLOW *Colias croceus*

Clouded yellows were recorded at three transects, Hutchinson's Bank Nature Reserve, London Wetland Centre at Barn Elms and South Norwood Country Park. The index was the highest since large migrations of 2006 and particularly of 2000. In the wider LNHS recording area, clouded yellows were reported at Walton Reservoir at various dates between 16 July 2009 and 28 September 2009. Total count on transects: 17.

BRIMSTONE *Gonepteryx rhamni* (Figure 3)

The brimstone was recorded on all but two of the transects in 2009, and the index was the highest since that of 1992. The count at Beane Hill was the highest since the first record on a transect there in 1995; and is considered a result of a project to plant and establish a larval food-plant, alder buckthorn *Frangula alnus*. Planting and growth of the alder buckthorns has continued in addition to planting at other sites in the London Borough of Brent and elsewhere. Total count on transects: 874.

LARGE WHITE *Pieris brassicae*

The index was the highest since 1992. Total count on transects: 1,942.

SMALL WHITE *Pieris rapae*

Recorded on all of the transects in 2008. Total count on transects: 2,467.

GREEN-VEINED WHITE *Pieris napi*

Total count on transects: 1,634.

ORANGE TIP *Anthocharis cardamines* (Figure 4)

Orange tips were recorded on all but two transects. Total count on transects: 393.

GREEN HAIRSTREAK *Callophrys rubi*

Recorded from five transects, all in south London and generally chalk-based sites. Total count on transects: 14.

TABLE 1. Collated indices for butterfly species in London, 1999–2009. Indices have been rounded to the nearest whole number and have usually been set at 100 in 1990 or the first year of record, though indices may be set at 100 in other years or at a different figure where this aids interpretation. A blank indicates that the species had not yet been recorded on any transect in London. A zero indicates that a species was not observed on transects in that year but had previously been observed on a transect in London.

	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Small and Essex skippers	91	76	87	74	74	77	81	77	63	63	66
Large skipper	56	52	38	65	92	62	67	51	46	29	69
Dingy skipper	51	63	39	69	102	68	56	27	14	15	30
Grizzled skipper	63	28	16	48	41	81	21	26	44	67	117
Clouded yellow	0	2,255	0	75	121	108	0	554	24	88	300
Brimstone	72	113	89	89	76	107	103	96	69	71	131
Large white	113	120	102	167	109	139	152	139	68	113	292
Small white	92	136	119	153	174	253	205	186	188	152	229
Green-veined white	90	97	62	99	77	99	67	56	51	49	97
Orange tip	47	76	62	78	43	64	75	51	35	39	77
Green hairstreak	35	31	128	184	74	106	59	39	105	64	68
Purple hairstreak	270	316	214	359	217	323	541	400	378	496	563
White-letter hairstreak	7	7	16	9	11	7	45	70	15	19	51
Small copper	39	21	5	6	57	49	21	54	47	30	47
Small blue	175	188	389	205	43	65	130	459	288	194	346
Brown argus	10	15	6	14	28	28	13	33	23	14	20
Common blue	81	66	37	46	133	59	51	115	33	39	87
Chalkhill blue	180	90	85	39	39	89	29	129	10	3	10
Holly blue	37	43	51	41	42	61	69	38	68	59	23
White admiral	0	0	0	0	0	100	0	0	0	100	0
Purple emperor							100	0	0	0	0
Red admiral	128	262	192	210	423	131	165	383	397	145	144
Painted lady	9	59	7	70	373	36	3	227	35	4	994
Small tortoiseshell	153	73	44	25	66	144	53	27	12	5	10
Large tortoiseshell											100
Peacock	1,087	1,462	1,060	637	385	586	510	316	397	315	854
Comma	111	193	142	127	195	144	120	221	112	114	294
Dark green fritillary	181	63	7	11	91	9	4	0	0	0	11
Silver-washed fritillary	100	300	100	0	0	0	125	500	0	0	125
Speckled wood	162	174	146	203	231	139	147	130	122	187	234
Marbled white	54	40	14	18	36	25	13	37	33	59	65
Gatekeeper	139	151	135	129	162	208	252	205	161	156	190
Meadow brown	149	145	90	67	136	113	150	130	76	84	79
Ringlet	354	470	234	293	391	227	173	212	143	267	329
Small heath	3	2	1	1	8	6	8	9	10	7	7

Purple hairstreak *Neozephyrus quercus*

Recorded at over a third of the transects, with the Kenwood Estate transect representing almost half of the total count. The index was the highest since 1992 and probably since monitoring commenced in London in 1978. Purple hairstreaks generally fly in the evening and were possibly more frequent and widespread than suggested by the daytime transects, particularly where there were oak trees and woodland with oak. Records were received from several other sites in London. Total count on transects: 106.

White-letter hairstreak *Satyrium w-album*

The majority of the transect counts were from the Horsenden Hill East and West transects, with the remainder from Cranford Park and the Brent Reservoir. Total count on transects: 29.

Small copper *Lycaena phlaeas*

Though recorded on most transects, the populations of the small copper tend to be confined to areas of suitable habitat; and Cranford Park and Mitcham Common route A accounted for over half of the total transect counts. One was observed near to Fryent Country Park though there have been no transect records there since those of 2004. Total count on transects: 290.

Small blue *Cupido minimus*

Most of the transect count was from Hutchinson's Bank Nature Reserve, with singletons from Riddlesdown and Riddlesdown Quarry. Total count on transects: 32.

Brown argus *Aricia agestis*

Eight transects recorded the brown argus. Total count on transects: 29.

Common blue *Polyommatus icarus*

The common blue was recorded on most transects in 2009 and particularly chalk downland sites but also at Tower Hamlets Cemetery Park, the London Wetland Centre at Barn Elms, Mitcham Common, and the Brent Reservoir. Total count on transects: 1,217.

Chalkhill blue *Polyommatus coridon*

The chalkhill blue was recorded at the Riddlesdown transect. Total count on transects: 7.

Holly blue *Celastrina argiolus*

Widespread and recorded on most transects, the index however was the lowest since 1997. Approximately a third of the total count was at Tower Hamlets Cemetery Park. Total count on transects: 185.

Red admiral *Vanessa atalanta*

A widespread species, with numbers similar to 2008 and below average compared with the past decade. Taking records from all sources, the red admiral was recorded in London in 2009 in all months from January to October. Total count on transects: 136.

Painted lady *Vanessa cardui*

There was a large migration of the painted lady in 2009 with records from all transect sites; and, in London, the index appeared to be the highest since monitoring commenced in 1978. The nearest comparable migration was of

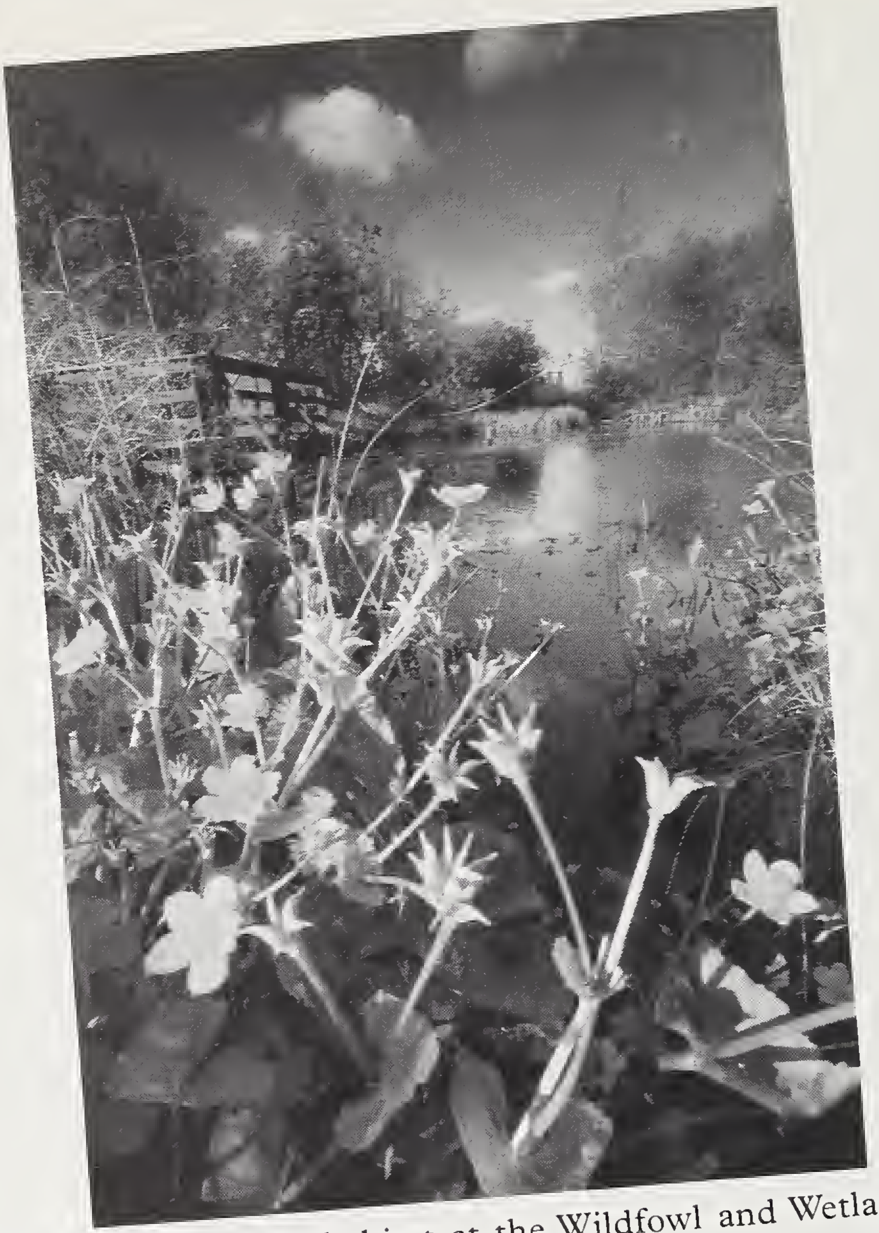

FIGURE 1. Marsh marigold and habitat at the Wildfowl and Wetlands Trust London Wetland Centre. *Photo: Ross Paxton*

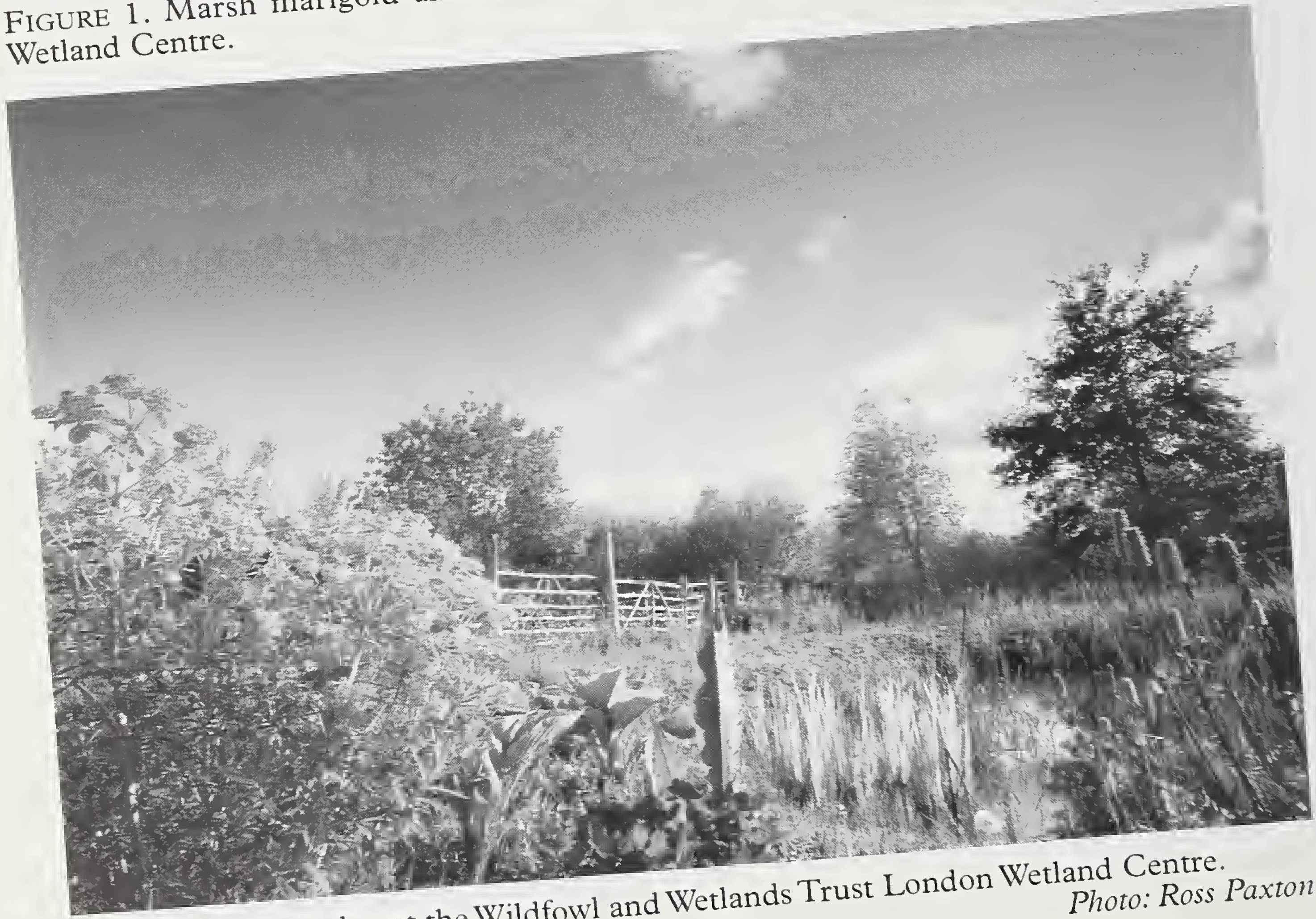

FIGURE 2. Bog garden at the Wildfowl and Wetlands Trust London Wetland Centre. *Photo: Ross Paxton*

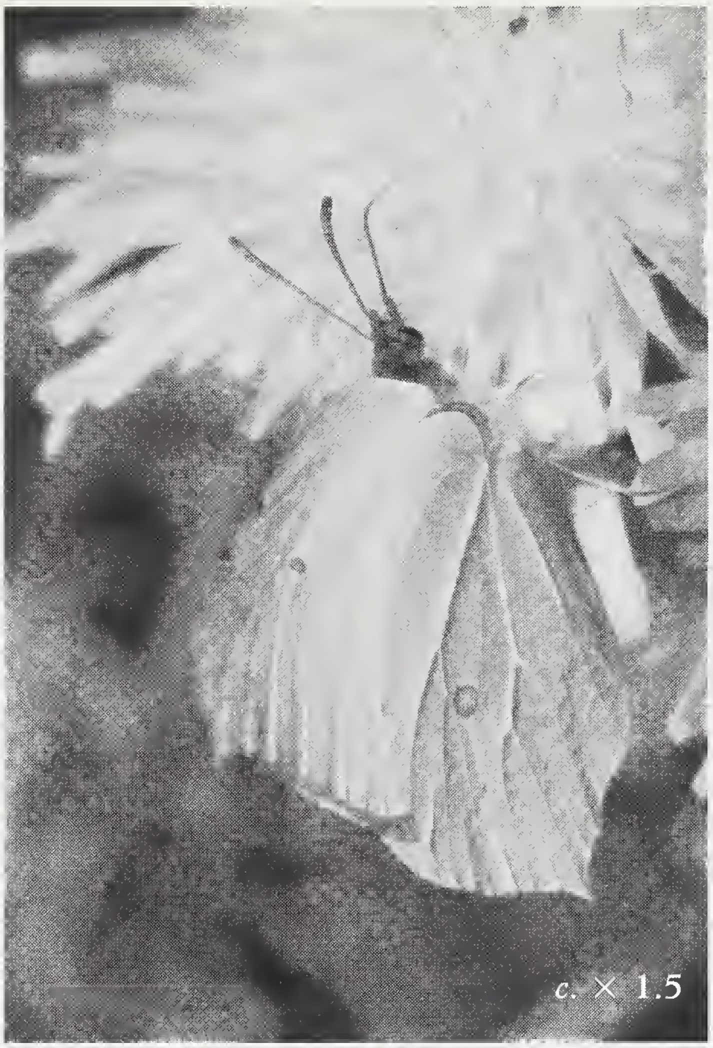

FIGURE 3. Brimstone on dandelion at the Wildfowl and Wetlands Trust London Wetland Centre. *Photo: Paul Gregory*

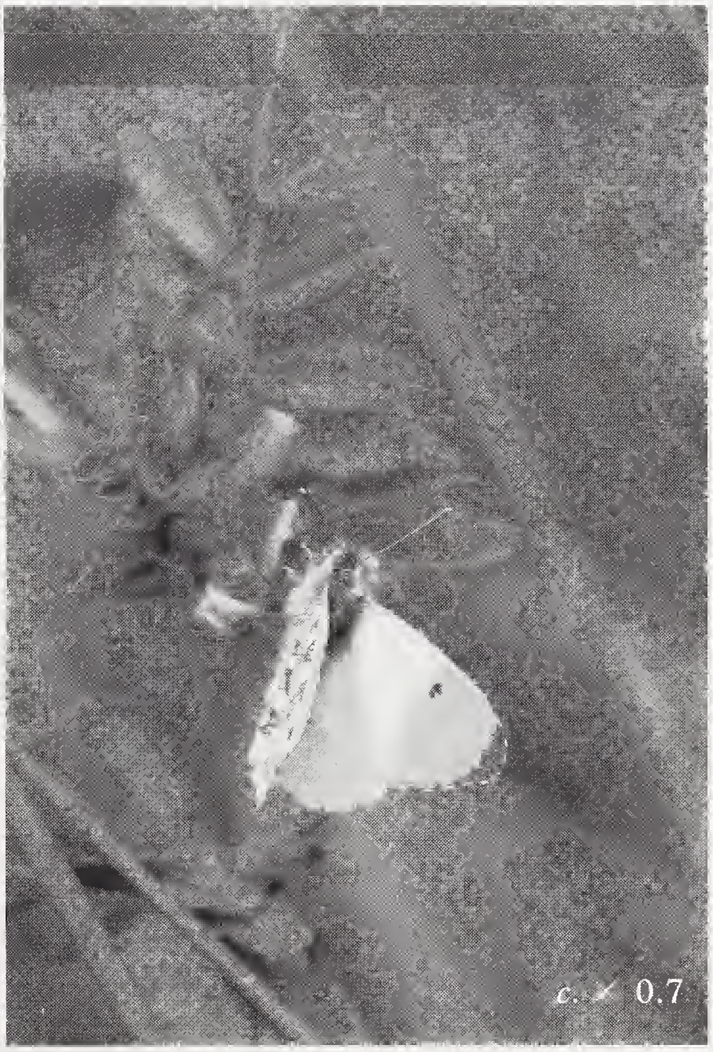

FIGURE 4. Orange tip on common vetch at the Wildfowl and Wetlands Trust London Wetland Centre. *Photo: Paul Gregory*

1996 which for London was approximately a third lower than that of 2009, though Butterfly Conservation (5 March 2010. News. http://www.butterfly-conservation.org) suggest from initial UK results that the 1996 migration was larger. The first London records of the migration were on 19 May 2009 at Hutchinson's Bank Nature Reserve, Tower Hamlets Cemetery Park, and a sighting in Wembley. Numbers rapidly rose in transect week 8 (20–26 May 2009) and peaked in week 9 (27 May–2 June 2009) (Figure 5). After the main migration had passed through, numbers dropped though there was a smaller peak in weeks 17–19 (22 July–11 August 2009). Other records noted a similar pattern. David Howdon and others reported one at Horsenden Hill 21 May 2009, seven on 23 May, 21 on 24 May, 124 on 25 May, and 60 on 30 May 2009. Diane Andrews recorded from various sites in the LNHS area with first records on 24 May 2009, peak numbers between 26 and 29 May 2009; while the last record was of one at Fortune Green/Hampstead Cemetery (TQ 248855) on 12 October 2009. This was one of several reports from early October, and Neil Anderson noted that one seen on 4 October 2009 was a fresh specimen. Some of the transect sites reported much larger numbers than other sites. That could be due to several reasons and at some sites the day of the weekly recording could have missed the day of the peak movement of the migration. It is also possible that the painted lady had a preference for some migration routes, and for example, birdwatchers at the Brent Reservoir reported large counts over the water. A south to north-east direction of the migration was noted by many observers and often at approximately one metre above ground level: for an account in north-east Hertfordshire, outside of the LNHS area, see MacMurdie (2009). Steve Spooner recorded the northward movement at Bookham Common as 20 per hour between 12.00 and 14.00 hours BST on 28 May 2009; and at Walton Reservoir as 15 per hour between 10.00 and 12.00 hours BST on 29 May 2009. Total count on transects: 968.

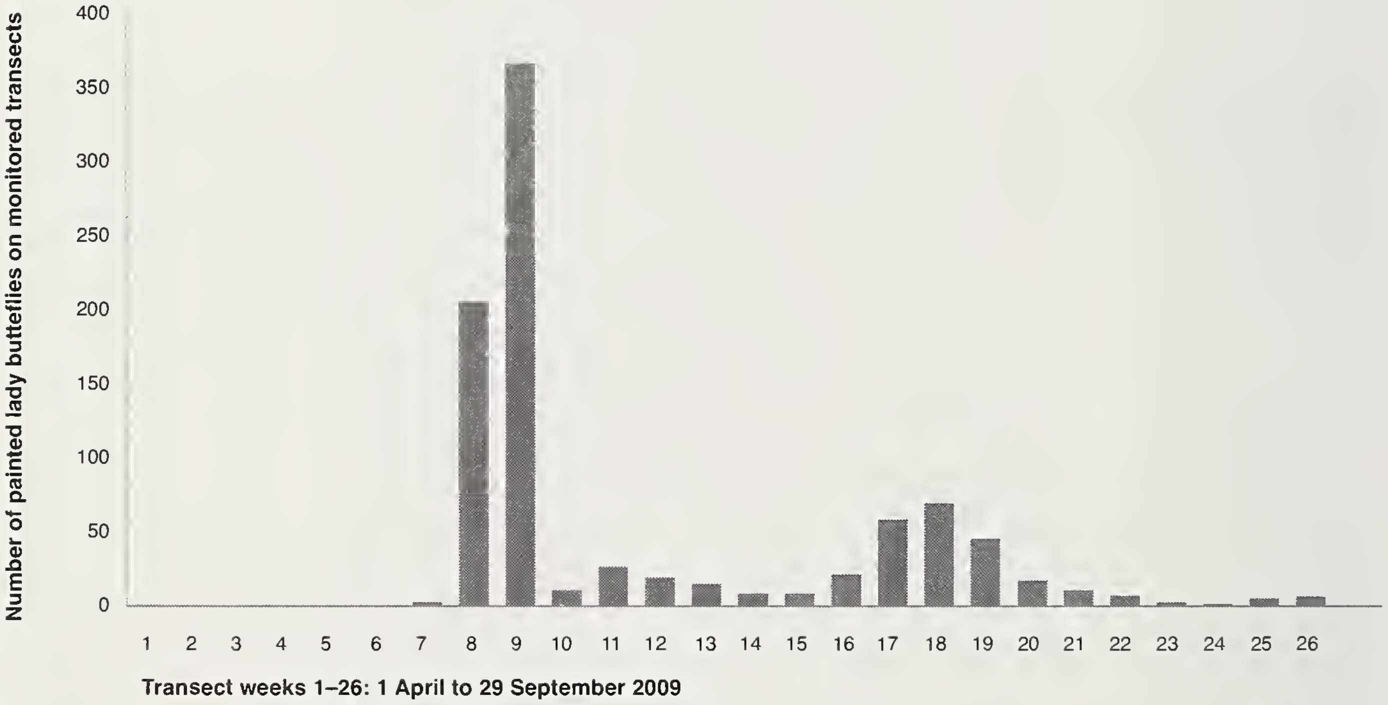

FIGURE 5. Weekly counts of the painted lady *Vanessa cardui* from transect sites in London in 2009. The graph is based on the actual counts of 27 transects for which there was reasonably consistent coverage and recording effort between the first week in April (commencing on 1 April) and 29 September at the end of week 26. Note that recording of butterflies could be affected by persistent poor weather in some weeks. The first records were on 19 May 2009 at the end of week 7 (13–19 May 2009); and numbers rose in week 8 (20–26 May 2009) to peak in week 9 (27 May–2 June 2009). The smaller peaks in weeks 17 to 19 were between the dates of 22 July and 11 August 2009.

SMALL TORTOISESHELL *Aglais urticae*

The index was approximately twice that of 2008 but the two years were the lowest since butterfly monitoring commenced in London in 1978. The species was recorded on less than half of the transects. The UK Butterfly Monitoring Scheme results for 2008 (Botham et al. 2009) noted that 2008 was the fourth consecutive year in which the collated index for the small tortoiseshell was the worst in the series since 1976. Total count on transects: 40.

LARGE TORTOISESHELL *Nymphalis polychloros*

A large tortoiseshell was observed by Terry Lyle on the Tower Hamlets Cemetery Park transect on 27 September 2009 and followed an observation off the transect. This is the first transect record for this species in London. Asher et al. (2001) report that British sightings during recent decades were of migrants from Continental Europe, released or escaped individuals. Plant (1987) noted 38 reliable sightings of the species in the LNHS recording area during the twentieth century to 1986. Total on transects: 1.

PEACOCK *Inachis io*

The index for the peacock was the highest since 2001. Total count on transects: 1,084.

COMMA *Polygonia c-album*

Recorded in 2009 on all London transects but one, the index for the comma was the highest since 1992. Total count on transects: 902.

DARK GREEN FRITILLARY *Argynnis aglaja*

Three were recorded at Hutchinson's Bank Nature Reserve. Total count on transects: 3.

SILVER-WASHED FRITILLARY *Argynnis paphia*

One was recorded at South Norwood Country Park on 6 August 2009. In the wider LNHS recording area one was recorded at Bookham Common on 8 July 2009. Total count on transects: 1.

SPECKLED WOOD *Pararge aegeria*

The index for the speckled wood was the highest in London since monitoring commenced in 1978, though the index in 2003 was only slightly lower. Indeed, in 1978, the speckled wood appeared to be absent from much of London. On the Hampstead Heath transect, none was recorded until 1981 (the 2009 count was 91) and there were no transect records at Fryent Country Park when that transect was established in 1986, though the count was 16 in 1987 (the 2009 count was 156). It was recorded on all but one transect in 2009 and is now amongst the most widespread of species in London. Total count on transects: 3,617.

MARBLED WHITE *Melanargia galathea*

Most of the transect count of the marbled white was from Hutchinson's Bank Nature Reserve, and most of the other nine transects where it was recorded were also on chalk strata, but there were also populations at the Brent Reservoir, Mitcham Common route B and at Horsenden Hill East and West. The index was the highest since 1997 but only slightly higher than in the years 2008 and 1998. Total count on transects: 540.

GATEKEEPER *Pyronia tithonus*

Recorded on all but one of the transects. Total count on transects: 3,148.

MEADOW BROWN *Maniola jurtina*

A species of grassland habitats, the meadow brown was recorded on all transects. Total count on transects: 7,217.

RINGLET *Aphantopus hyperantus*

Recorded on half of the transects and particularly the sites with chalk grassland on the southern edge of London. The population at Mitcham Common appears to have established during recent years, while the first transect records at the Brent Reservoir resulted in a count of sixteen which suggested a population. There were also the first transect records from Hampstead Heath. The ringlet was also recorded at Spring Park and at South Norwood Country Park, and away from the transects at Perivale Wood and at Horsenden Hill. Total count on transects: 1,066.

SMALL HEATH *Coenonympha pamphilus*

The index remained low and with records from five transects it was evident that the small heath is in London confined to sites with suitable habitat. Total count on transects: 205.

Species recorded beyond Greater London but within the wider LNHS recording area, and all by Steve Spooner were:

SILVER-STUDDED BLUE *Plebeius argus*. Ten individuals were recorded from Fairmile Common on 21 July 2009.

WHITE ADMIRAL *Limenitis camilla*. One was recorded at Bookham Common on 17 June 2009.

WALL *Lasiommata megera*. A singleton was recorded in a residential road at Meadow View, Stanwell Moor Village at TQ033734 on 13 October 2009 by Steve Spooner. The weather was mild and sunny, and the butterfly was seen sunning itself and then in flight as it flew into a private garden. Botham et al. (2009) report that the wall brown had declined nationally by over 80 per cent since 1976. There do not appear to have been any recent Greater London records following a rapid decline in the 1990s.

Discussion

Habitat loss, fragmentation and habitat change in London present a challenging environment for the conservation of butterflies. The concept developed by Asher et al. (2001) of listing British butterflies under the headings of 'wider countryside species', 'habitat specialists' and 'regular migrants' may require revision when applied to London. Several species that are considered generalists in the wider countryside are effectively confined in London to areas where suitable habitat occurs and in that respect they behave more as 'habitat specialists'. For some of these wider countryside species the shortage of habitat effectively places the species on the edge of their range in London, even though they retain the ecological mobility associated with wider countryside species. While the further loss of habitat in London could further restrict these species, so too are there opportunities for conservation where habitat can be restored or created.

For an overview of changes in the distribution and abundance of butterflies within the London area in the two decades since the work of Plant (1987), see Fox and Williams (2006). Trends in the abundance of butterfly species throughout the UK between 1976 and 2008 are summarized in Botham et al. (2009).

Acknowledgements

In 2009 the transect walkers included Richard Payne at Hampstead Heath; Michael Berthoud, Simon Mercer and Leslie Williams at Fryent Country Park and Beane Hill; Ann Rix at Gutteridge Wood; Andrew Scott, Gill Peachey, Rachel Thornley, Barry Gutteridge, Luke Barley, Matt Johnson, Shaun Waddell and Neil Sibley at the Corporation of London sites on the southern edge of London (Coulsdon, Farthing Downs, Kenley Common, Riddlesdown, Riddlesdown Quarry, Farthing Downs New Hill, Spring Park); Paul Moorhouse at Mitcham Common route A; Martin Boyle at Mitcham Common route B; R. J. Bullock at WWT Wetland Centre at Barn Elms; Catherine Price and Rebecca Turpin at Railway Fields; Martin Wills at Hutchinson's Bank and Chapel Bank; Rob Solomon and Richard Featherstone at Cranford Park; Malcolm Bridge at South Norwood Country Park; Terry Lyle at Tower Hamlets Cemetery Park; Andy Brown at Gunnersbury Triangle; Andrew Self, Roy Beddard and Andrew Verrall at the Brent Reservoir; Donald Rooum at Regent's Canal and Mile End Road to Mare Street; Mike Taylor at Kenwood; David Howdon, Andrew J. Culshaw, Martin Smith and Jo Wilson at Horsenden Hill East and West and at Perivale Wood; Kris Zymla, Jane Clarke and David Green at Camley Street Natural Park; and Oliver Halford at Bronzefield. Records were also received from Neil Anderson, Diane Andews; a large number of records were received from David Howdon and team (Andrew J Culshaw, Martin Smith, Jo Wilson, Rae Hall, Fiona Barclay and Max Whitby) from the Horsenden Hill and Perivale Wood areas; Bob Husband, Debbie Pledge, Steve J. Spooner; and from London Natural History Society field meetings/LNHS *Newsletter*, and the Butterfly Conservation Hertfordshire and Middlesex Branch *Newsletter*. The support of the landowners and land managers of the transect and other sites are acknowledged, including a significant number of the London boroughs (see the Methods), the Corporation of London, other public authorities, the London Wildlife Trust, the Mitcham Common Conservators, the Friends of Tower Hamlets Cemetery Park, Barn Hill Conservation Group and the Welsh Harp Conservation Group. The co-operation with the county coordinators for Butterfly Conservation is noted, particularly from Andrew Wood and John Murray for Hertfordshire and Middlesex. Dr Dave Dawson had previously advised on the statistical method for the collations and the programming of the spreadsheets. Simon Mercer helped develop the series of linked spreadsheets. Thanks also to Ross Paxton, Paul Gregory and Jamie Wyver of WWT for the photographs.

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Book review

Arachnids. Jan Beccaloni. Natural History Museum, London. 2009. 320 pp., hardback, large quarto, £30. ISBN 978 0 565 09220 7.

Jan Beccaloni's *Arachnids* is a major account of a host of creatures that the general public may be unaware of; she is at pains to show that 'spiders aren't the only arachnids'.

As curator of arachnids at the Natural History Museum she is naturally concerned to demythologize and describe many lesser-known groups — several of which are not found in the British Isles — and to popularize all our eight-legged friends. Unfortunately, I suspect that she may be waging a losing battle with readers of a nervous disposition or those that are prone to zoological nightmares. Fearsome in fang, claw, sting or mien, many creatures featured in *Arachnids* should perhaps carry a mental health warning — those pictured on pages 101 and 158 definitely, and those on pages 186, 261 and 290, most probably.

For the rest of us, Jan Beccaloni's comprehensive survey is a most welcome account of the external appearance and internal anatomy of groups like whip spiders, whip scorpions and micro whip scorpions, as well as more familiar spiders, mites and harvestmen.

The behaviour of these different groups is detailed; most are carnivorous and the range of different strategies for obtaining their prey is enormous, from 'sit-and-wait' strategies to the complex web-spinning of many spiders. 'The best way to avoid being eaten by a predator is to avoid the predator'; as the author points out, this is one reason why many arachnids — even fearsome scorpions but especially the smaller ones like pseudoscorpions — hide away under stones, in burrows or under leaf litter, especially in the daytime. Camouflage plays an important role for many arachnids — our own 'bird-dropping spider' being a very good example — while many poisonous or unpalatable species advertise their presence by their bright coloration.

As one would expect from a museum specialist, this book is particularly detailed in its descriptions of the anatomy and physiology of arachnids, well illustrated by the spectacular photographs from all over the world. These are so fascinating that in some cases the brief captions leave the reader thirsting for more information. The emphasis throughout is on the global fauna; for the British reader it is perhaps unfortunate that very few of the pictures show our own fauna even in those groups which do occur here. For those species likely to be encountered in tropical forests or hot deserts, this is a valuable addition to the literature. For readers who would like more information about British arachnids the website of the British Arachnological Society (www.britishspiders.org.uk) will complement the information and pictures of this handsome book.

EDWARD MILNER

Odonata report for 2009

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Generally 2009 was good for Odonata, especially for the early season species. One early species, *Brachytron pratense* hairy dragonfly was again seen in good numbers in parts of the Lea Valley. During a field trip I led there on 16 May we saw no fewer than eight individuals in less than ideal conditions. This included individuals near Cheshunt and en route to Cornmill Meadows. This is a species showing a real resurgence after nearly disappearing in our area in the 1980s. By the mid 1990s, hairy dragonflies were again being recorded in the Lea Valley and now also in Epping Forest. A record of this species has also been received for the London Wetland Centre which has suitable habitat for it. There have been other solitary records from this site in previous years, but no evidence of any colonization to date; records are presumed to be wandering individuals. Hopefully in time the hairy dragonfly will become resident at this central location.

The London Wetland Centre also had its first unexpected record of *Cordulia aenea* downy emerald. This was identified by the resident ecologist Dr Richard Bullock on 16 June. Unfortunately, by the time I was there in early evening to assist in a plant-recording session there was no sign of it anymore! Downy emerald is a habitat specialist which favours woodland pools and the larvae require coarse leaf litter near the pond margins, avoiding finer substrates. With the maturation of vegetation at the LWC it is possible to manage ponds that could provide the ecological niche required by this species, but perhaps the site is rather isolated from other sites, as downy emerald has a poor reputation as a colonizer.

It is interesting that Longfield (1949) gave reference to this species breeding sparingly in Richmond Park, Wimbledon Common and Bookham Common. I have no recent reports from these sites. Currently this species is still extant on Esher Common (it is more common in Surrey than other counties) where it co-exists with the even scarcer (in the LNHS area) *Somatochlora metallica* brilliant emerald and is also found at some of the Epping Forest ponds such as Wake Valley Pond. In Essex this species is confined to the western area.

Negative news appears to be the local extinction of *Sympetrum danae* black darter on Wimbledon Common. If the species is still present, it is at a very low level. The population was centred on Blue Gate Pit, a shallow acidic pool with a propensity to dry out in hot summers. In 2009 I spent considerable time trying to locate the species in perfect weather conditions at the peak flight time to no avail. This is at least the third season I have failed to find it here. Other more regular vistors to this site, such as Gay Carr, also failed to find black darter. Hot dry summers resulting in drying out of the pool may be a factor, yet other species such as *S. sanguineum* ruddy darter and *Lestes sponsa* emerald damselfly, maintain good populations here, though are more widespread locally.

The black darter can still be found on Esher Common and is common on some of the Surrey heaths beyond our recording area. As the black darter, like other *Sympetrum* species are well known as migrants as well as residents, it is possible a recolonization may occur at Wimbledon under favourable conditions. The problem remains the isolation of this site though from surrounding populations. The black darter is most widespread in the west and north of Britain in acidic sites and generally scarce or absent in much of the south-east where there is a lack of suitable habitat.

Also, 2009 will be remembered for the amazing influx of *Cynthia cardui* painted lady during the second half of May. Associated with this were records of other insects too, especially *Sympetrum fonscolombii* red-veined darter. Many of these records were from the south-west and south Wales with some pairs in tandem being observed. This southern species is a regular migrant to Britain with records received most years and there are some populations in Kent and Cornwall that have persisted for a few years. In 2009 I am aware of four records from the LNHS area — all mature males. The first was at Brent Reservoir on 25 May and photographed by Andrew Self; Colin Jupp found one at Bedfords Park, near Romford on 2 June; one was photographed in Richmond Park and another at Beddington Sewage Farm by Alistair Flood in early July.

Undoubtedly the most exciting discovery was of an apparent population of *Calopteryx virgo* beautiful demoiselle at Bookham Common on the small Bayfield Stream. Visiting the site on 13 June I spotted a male settled beside the stream in an open sunny situation. On further investigation no fewer than four males were seen chasing around and resettling. Also a single female was located. Returning to Bookham Common to lead a study day the following month, on 4 July, a hot and sunny day reaching 26°C, I couldn't find any in the same area, but some distance further upstream in a much shadier section one of the party discovered a male resting on scrub. Closer scrutiny revealed the presence of three males and a solitary female mostly resting on foliage. It is most likely these indiviuals were different from those recorded on the earlier date as males on average are thought to patrol for about ten days on territory.

Though it is yet to be proved, it does seem likely there may be a small breeding population on the Bayfield Stream which would be the only known such population in our area. This is a species common in the west of the country inhabiting clear fast-flowing streams with a pebble substrate. Historical records showed both Lucas (1900) and Longfield (1949) recorded this species on the River Mole near Leatherhead. It disappeared from the Mole in the 1960s due to deteriorating water quality. It was refound on the Mole outside our area near Gatwick in 1993 by P. Follett and has subsequently spread to other sites on this river system. I did receive a photographic record of a male by Dr A. D. Prowse a few years back, which I assumed to be a wandering individual at the time, with no subsequent records until 2009. Hopefully, further records can be confirmed in 2010 and maybe proof of successful breeding with exuviae discovered.

Finally, recent years have seen many species expand their ranges probably in relation to a warming climate. This has also resulted in new arrivals becoming more frequent, none more dynamic than *Erythromma viridulum* small red-eyed damselfly which was unknown in the UK before 1999. Since breeding was confirmed at several sites in 2002 this species has rapidly spread through south-east England and the Midlands and is now regularly encountered on suitable waterbodies in the LNHS area.

Another species for recorders to watch out for in 2010 and beyond is another recent arrival — *Lestes viridis* willow emerald. Prior to last year there was a dubious record from 1899, a record of an exuvia from Cliffe Marshes, Kent in 1992 and single adult records from Hastings, *c.* 1980 and one at Trimley, Suffolk in 2007. In 2009 a large number of records were found in Suffolk during August, with ovipositing into branches above water seen at several sites. Sightings continued into September and a singleton was seen further south at Fingringhoe Wick, Essex. It follows that if this species consolidates its status there is every chance it may be discovered in our area, particularly on the Essex side, in the next few years.

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Survey of Bookham Common

SIXTY-EIGHTH YEAR

Progress Report for 2009

Introduction 79
Vegetation 80
  Vascular plants 80
  Fungi 80
The distribution of large oaks *Quercus robur* on Bookham Common 82
Birds 89
Dragonflies and other insects Field Study Day, 4 July 2009 89
Grasshoppers and bush-crickets Field Study Day, 8 August 2009 90
Additional field notes 91
Contributors' addresses 92

Introduction (Stuart Cole, Chairman, Bookham Common Survey)

This was a busier year at the Common with, amongst other activity, the National Trust making considerable progress in its programme of thinning the mature oak woodland in order to diversify the habitat, Tristan Bantock and Paul Wheeler joining us to survey, respectively, the bugs and moths of Bookham, and the BBC filming for an episode of the 'Museum of Life'.

On 30 June the BBC spent a day filming for the TV series 'Museum of Life' about the work of London's Natural History Museum. Staff from the Museum's Entomology Department 'fogged' a mature oak tree to see what insects inhabit the foliage, particularly the canopy. This involved suspending a network of funnel-shaped collecting trays around the tree, each with a collecting jar containing an alcohol solution attached to the bottom of the funnel. Clouds of insecticide were propelled upwards into the canopy knocking all the inhabitants into the nets. Staff also set up a Malaise trap, a large tunnel-like sheet that simply catches any insects that happen to fly into it and these then also fall into a jar of alcohol.

A cursory look at the catch on the day showed that most of it consisted of numerous and varied small flies and Hymenoptera-Parasitica. Just one fly was immediately identifiable and that was the handsome hoverfly *Sericomya silentis* that was in the trap. Of the dozen beetle species caught, one was a new record for Surrey, the tiny fungus feeding *Cis coluber*. A full examination of all the specimens will be made by NHM staff as and when time permits and records will be included in a future Bookham report.

We are fortunate to have two new recorders working on Bookham's insects and we can expect the species lists to be significantly enhanced. Tristan Bantock, the LNHS Hemiptera recorder is building on earlier work on the Common's Heteroptera by Dennis Leston and Eric Groves as well as recording the Auchenorhyncha (leaf hoppers etc.).

Paul Wheeler, Butterfly Conservation's Moth Officer for Surrey and SW London and long-standing LNHS member, assessed the feasibility of light trapping based at the LNHS hut in the garden of Merritt's Cottage. A visit in June showed that this would work well, setting up the traps a night or two prior to Bookham survey days with the live moths then examined on the Saturday morning. A second visit in October, trapping to midnight on a very murky night — good for moths — proved even more interesting, so Paul is aiming to resume trapping monthly in 2010 from April to September, then given suitable weather, October and November.

Full lists of Tristan's and Paul's records will be published in a future *London Naturalist.*

Vegetation (Steve Mellor)

Vascular plants

The present two-year report of taxa seen or identified during 2008 and 2009 is of plants that are new to the accumulative list of vascular plants recorded on Bookham Common. Turkish squill *Scilla bithynica* has appeared in Division R at the edge of the Common adjacent to the railway line. It flowers from the end of March and forms fruit capsules before it is engulfed by rank native vegetation. It is thriving in this wooded site and from small beginnings there are now two substantial rosettes of leaves producing a number of flowering stems. *Scilla bithynica* is a rare garden escapee in Britain but is known nearby on shaded paths in Little Bookham. A cluster of orpine *Sedum telephium* plants has been found in the woodland edge in Division M east of Broadway South. Deer appear to be eating leaves and flowers in the autumn, but *Sedum telephium* is a robust taxon and is expected to survive. Though a native, new wild colonies are often the robust garden forms and we believe ours probably came in with fly-tipped garden waste.

Two neophytes that have become well established in the countryside in recent years and have made their first appearances on the Common are Bilbao fleabane *Conyza floribunda* (formerly *C. bilbaoana*) and Nuttall's waterweed *Elodea nuttallii*. *Conyza* taxa produce huge numbers of seeds that can be dispersed over great distances on the wind. A few *Conyza floribunda* plants grew on bonfire ash following clearance of secondary woodland in Division S. *E. nuttallii* is now the most common *Elodea* taxon naturalizing in water bodies locally. It grew prolifically in Eastern Hollow Pond in Division N and in the autumn covered the whole pond to a depth of several inches. Dogs taking their daily dip had to improvise a version of walking on the water in order to extricate themselves from the tangle. Perhaps excessive metabolic processes were the reason why this pond alone dried out completely in 2009 leaving a wasteland of rotting vegetation surrounded by patches of New Zealand pigmyweed *Crassula helmsii*. Hopefully, the ongoing refurbishment of the Upper and Lower Eastern Ponds by the National Trust will soon be extended to Eastern Hollow Pond.

The provenance of wild populations of dark mullein *Verbascum nigrum* can be uncertain, as it is an attractive taxon often grown in gardens. Two small plants that grew on a dry bank in Division E near Isle of Wight Enclosure are first records for the Common. They were near a parking area for machinery brought in for use in management clearances etc., and our experience is that such practice is often a prelude to the unexpected appearance of new taxa presumably brought in on caterpillar tracks and wheels. They might well be native plants. There should be no doubt that a clump of intermediate polypody *Polypodium interjectum* discovered growing on a fallen branch in Division S was a native. Sadly though, it now appears to have been destroyed by the said caterpillar tracks on vehicles used in recent clearances of secondary woodland there. Finally, we had an intriguing note from Graham Medcalf who reported seeing narrow-leaved bird's-foot trefoil *Lotus corniculatus* somewhere near the Hundred Pound car park. As yet we have not confirmed this find that would be a first for the Common; the search continues.

Fungi

For three years we have held an autumn fungus foray, but lacking sufficient expertise ourselves, Ray Tantram has kindly led the meetings with help from colleagues from the West Weald Fungus Recording Group. These meetings have proved very popular, more than twenty people turning out in each. The adage 'the eyes have it' has applied with many pairs resulting in very good species lists compared with records locally for smaller groups. In 2009, after a generally

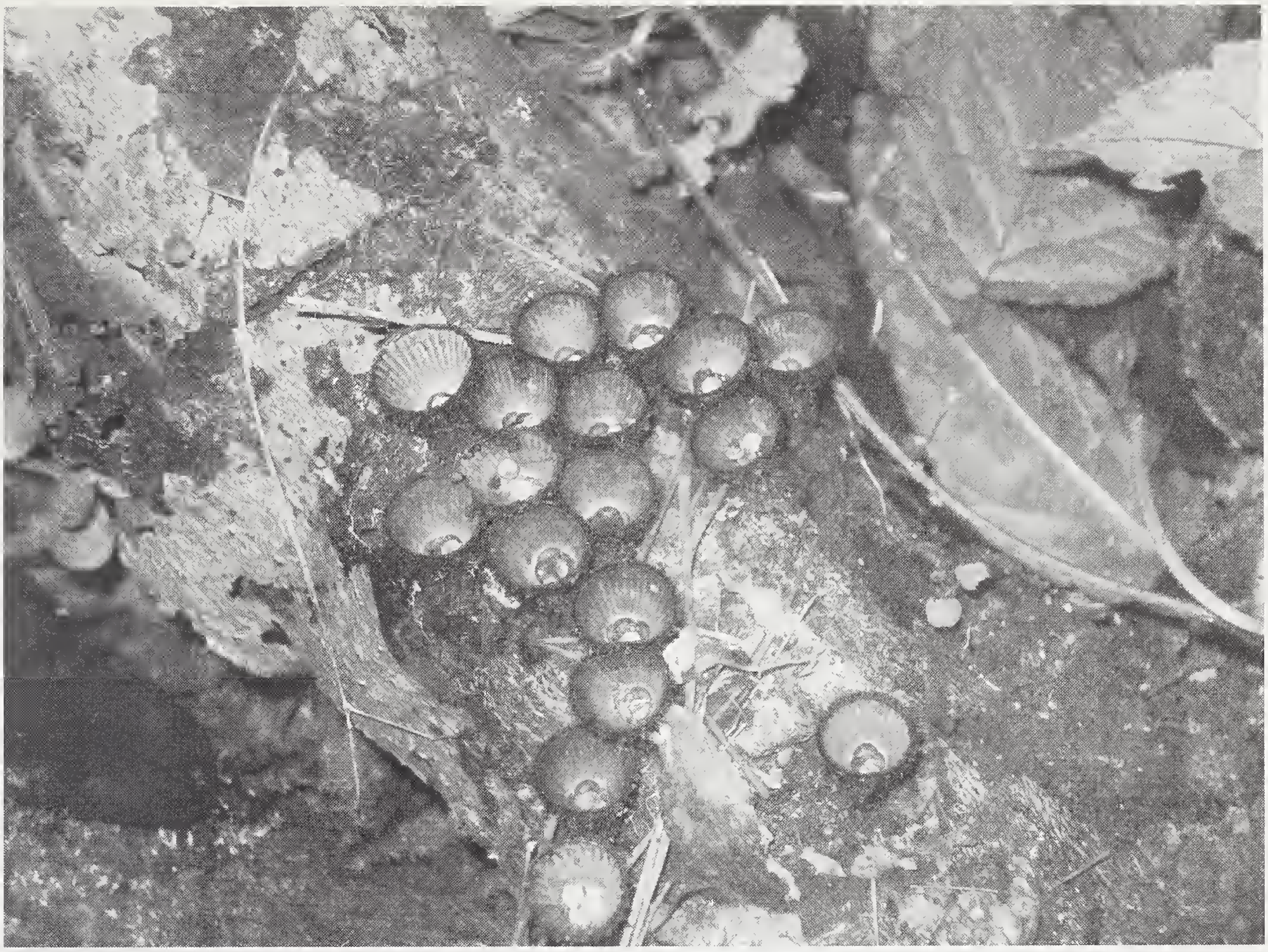

FIGURE 1. *Cyathus striatus.*

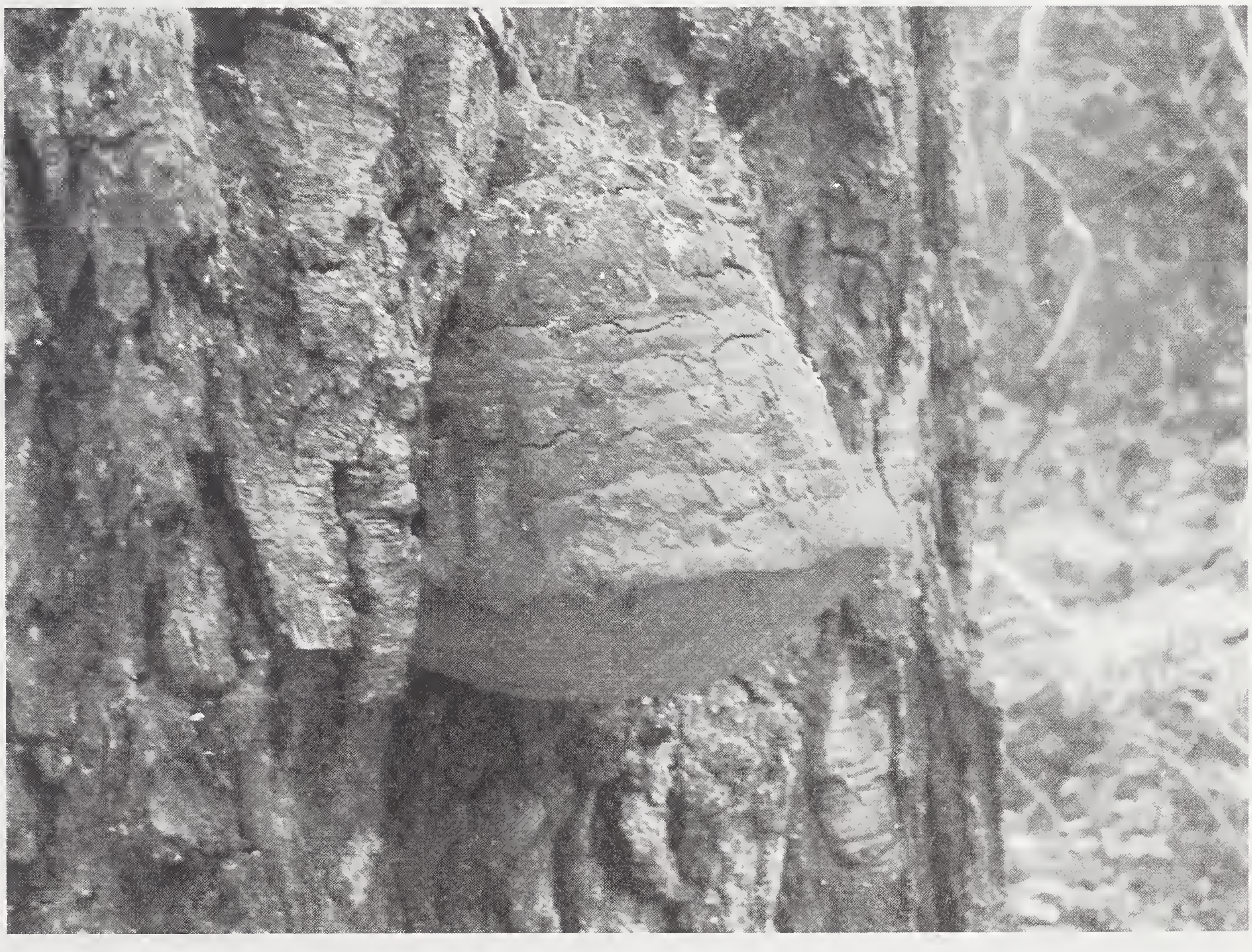

FIGURE 2. *Phellinus robustus.*

disappointing fungus year, we recorded 129 taxa. The intention is to accumulate sufficient man-recording hours for a sensible comparison of a recent species list with those recorded in earlier years on the Common. Two interesting taxa seen in 2009, were fluted bird's nest *Cyathus striatus* (Figure 1) and robust bracket *Phellinus robustus* (Figure 2). The perennial hoof fungus *P. robustus*, had been shown to many of us over the years by the late Ian Menzies, but we were not aware of the significance of its growing on oak *Quercus robur*. Ray immediately informed the mycological authorities and it was finally identified by Martin Ainsworth. It is a Red Data List species and this is the first verified record in Surrey. I suspect that with a little manipulation, our record became number 1,500,000 exactly in the British Mycological Society Fungal Records Database (FRDBI).

The distribution of large oaks *Quercus robur* on Bookham Common (Steve Mellor and Ian Swinney)

The Ancient Tree Forum, Woodland Trust and similar-minded charities recognize the great value that ancient trees play in preserving ecological diversity. They are presently coordinating a survey of ancient and veteran trees across the country and maps giving distribution and details of over 44,000 are on open access on the Ancient Tree Forum website (www.ancient-tree-hunt.org.uk). Additionally, the Surrey Biodiversity Partnership, and similar groups elsewhere, are encouraging the preservation of valuable habitats that are being lost as traditional land usage has declined. For example, The National Trust on Bookham Common have in recent years cleared encroaching trees and scrub from the traditional wet meadow areas in the west of the Common. Cattle are again being grazed here in order to preserve this valuable habitat and associated ecology.

The larger pedunculate oaks *Quercus robur* on Bookham Common are estimated to be 200–400 years old (Ted Green, pers. comm. 2006). This age is in reasonable accord with growth following the known removal of timber trees for the construction of Nonsuch Park Palace by Henry VIII around 1540 (Harvey 1943). Table 1 lists only those *Q. robur* with an average diameter of about one metre and greater, estimated from girth measured 1.5 m above the highpoint on the ground, but sometimes at other heights avoiding burrs, bumps and branches. Trees can be relocated using the four-figure grid references. Tree status is given in the comments and could be useful in locating specific habitats for investigation on for example standing dead wood, ivy cover, and nest holes. Figure 3 is a sketch map of the Common with the large oaks plotted as filled circles. Some of the large oaks fall outside the usual botanical recording area; a few surround Tunnel Car Park to the south, and others are found in Sheepbell Wood across the Cobham Road to the north-east. The shaded area on the map represents woodland as described by Castell (1955). It is interesting that areas of the Common that are now well wooded were still being kept open some considerable time after traditional usage of the land had ceased. Rabbits might well have been preventing scrub and tree growth on plains and it is relevant that 1954 is also the year when myxomatosis was first recorded on Bookham Common.

It is evident that large *Quercus robur* on Bookham Common grew on open sites as wide domed trees with many wide-spreading low branches and were often pollarded. This is the character of wood-pasture in which large trees and surrounding meadows were managed for their uses for timber, grazing and fodder etc. Clearly, these large oaks are situated where access was easiest, in areas where the meadows overlap into woodland and near the edges of the Common, particularly close to farmhouses. Such large trees do not occur in the unmanaged wildwood where competition for survival is fierce. Wildwood on the Common occurs in the large north-eastern sector. In more-recent years, the wood-pasture has been lost to the spreading woodland. This has meant that

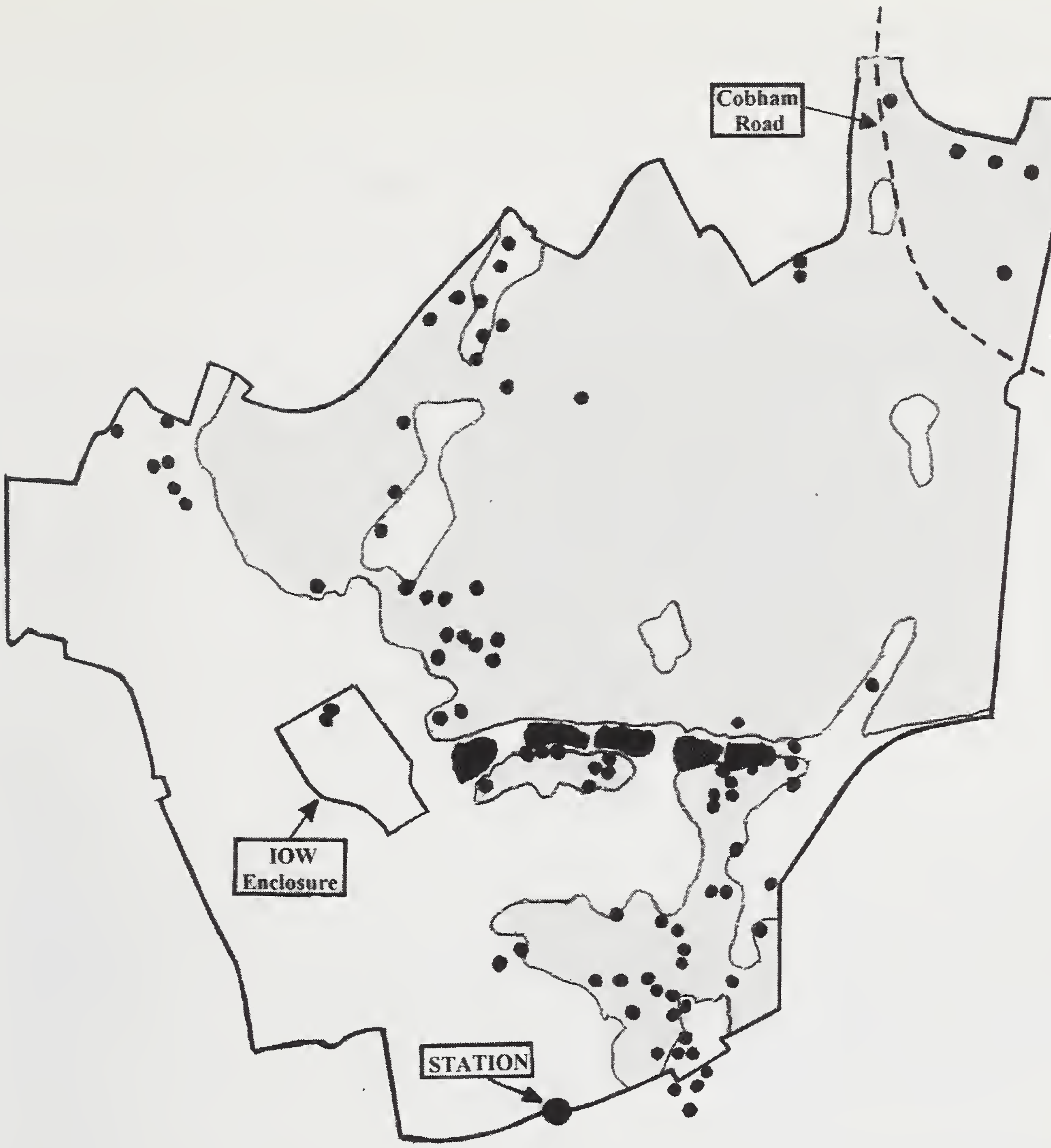

FIGURE 3. Sketch map showing the positions of large *Quercus robur* on Bookham Common.

the large oaks have shed lower branches or carry dead ones as a result of increasing shading from younger trees and scrub that now surrounds them. Wood-pasture is recognized as another valuable though endangered habitat as traditional usage has ceased (Natural England 2006–2007). Recent major management works by The National Trust on either side of Common Road South are being carried out to preserve the large oaks and to re-create conditions for the wood-pasture to re-establish on the Common.

During our survey, we also recorded smaller oaks and larger specimens of other tree species. Please contact the authors for help in locating these. Turkey oak *Quercus cerris*, having been planted in small numbers to the north of Bookham Common, has now spread to each of the twenty botanical recording divisions there. *Q. cerris* has proved to be more successful on the Common than *Q. robur*, readily producing seedlings in well-shaded situations unlike our native oak. A single more acceptable alien oak is also to be found on Bookham Common NT estate off the edge of Church Road meadow that lies south of Bookham Station and Tunnel Car Park. This is a Hungarian oak *Quercus frainetto* (Figure 4) that to the authors' knowledge has never flowered. It has grown to a large domed tree with many branches radiating spoke-like from a short trunk. This tree has a girth of about 5.6 metres and is the largest of the taxa recorded in Surrey, and one of the largest in Britain.

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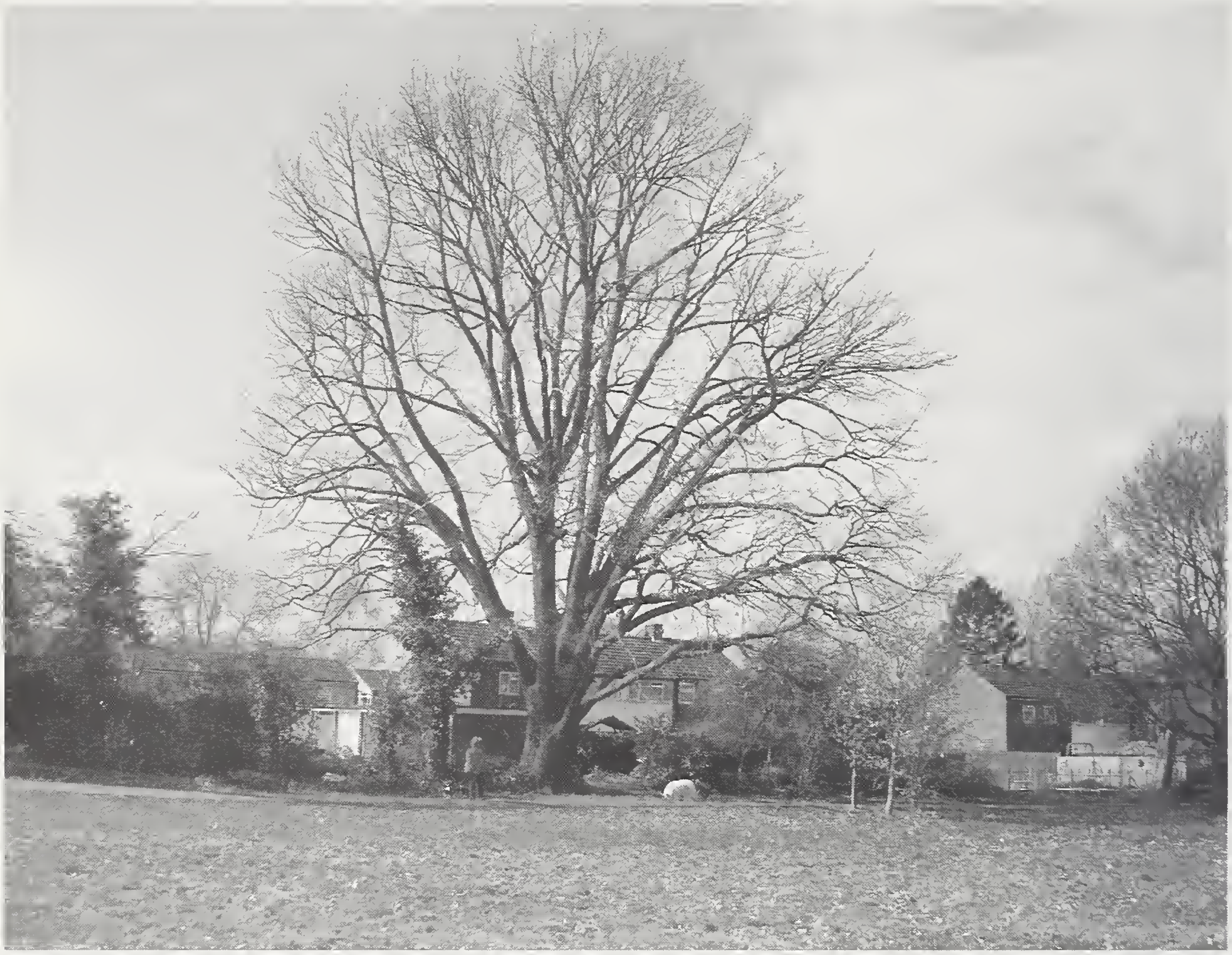

FIGURE 4. Hungarian oak.

TABLE 1. Large oaks *Quercus robur* recorded on Bookham Common, 2006–2009.

Tree no.	Grid Ref.	Girth (m)	Ht. of girth measurement 1.5m or as given	Tree form	Comment
1	TQ1208 5671	3.95		Maiden	Storm damage. Part of crown dead
2	TQ1215 5675	3.60		Maiden	Upper storm damage N side. Recent loss of large limb
6	TQ1261 5694	3.84		Maiden	Fine tree. Little die-back
7	TQ1269 5702	3.37		Pollard	Fine pollard. Some lower and side die-back from shading
8	TQ1268 5699	4.77	1.2m under branch/burrs	Pollard	Loss of side and lower limbs from shading

9	TQ1265 5694	5.04		Pollard	Many lower branches shed. Mechanical damage to trunk
10	TQ1268 5690	3.97		Maiden	Fine burred tree. Branch shed and die-back from shading
12	TQ1265 5688	3.20		Maiden	Storm damage in crown. Shaded, holly at base
13	TQ1259 5681	3.57		Maiden	Lower branches lost from shading. Much low Holly
14	TQ1253 5675	3.67		Maiden	Mechanical damage to lower trunk. Die-back
18	TQ1251 5663	3.82	1.0m under many burrs	Maiden	Tall profile. Side branches lost from shading
20	TQ1249 5658	3.37		Maiden	Side branches dead, mainly on shaded north side
22	TQ1253 5649	4.65	1.7m on piles of bark	Maiden	Dead (1990), standing, hollow
24	TQ1239 5649	3.41	measured over small burrs	Maiden	Major crown damage. Low spreading limbs shaded
26	TQ1219 5661	3.40		Pollard	Waisted tree. Good spreading branches
27	TQ1217 5664	3.60	1.7m on piles of bark	Maiden	Dead, standing. Girth measured over small ivy stems
28	TQ1215 5668	3.34		Maiden	Girth measured over ivy stems up to 15cm diameter
29	TQ1213 5668	3.79		Maiden	Spreading branches crown OK. Some damage W side
31	TQ1256 5647	3.44	1.25m under limbs	Pollard	Fine broad-crowned tree. Some loss of shaded side limbs
32	TQ1259 5647	3.43	1.3m below burrs	Maiden	Low spreading branches dead, now an upright tree
35	TQ1264 5648	3.14		Pollard	Good tree. Pollard branching at 3m
37	TQ1267 5640	4.06		Pollard	Dieback low down and to S. Large limb lost, vigorous regrowth
38	TQ1262 5641	3.63	1.3m below burrs	Pollard	Lower branches dead from shading
39	TQ1260 5641	3.25		Maiden	Die-back and old mechanical damage. Honeysuckle
40	TQ1258 5637	4.32	1.8m on fallen debris	Pollard	Only one large limb alive. Much decay debris. Ivy stems
41	TQ1280 5678	3.63		Maiden	Was shaded and with storm damage. Now in open
43	TQ1269 5680	3.62		Pollard	Many dead limbs from shading, upright main stems

44	TQ1265 5684	4.52	1.2m, under small burrs	Pollard	Multiple stems from 3m, shaded, surrounding holly
47	TQ1314 5699	3.09	1.3m	Maiden	Shaded, retained dead limbs on N side
48	TQ1329 5725	5.25		Maiden	Mighty tree, Some limbs shed and wounds from pruning
49	TQ1346 5716	3.42		Maiden	Dieback on N side, good spreading branches to S
50	TQ1351 5715	3.78		Maiden	Poor grid ref, surrounding holly and other shading. Die-back
52	TQ1340 5718	3.47	1.2m under branch	Maiden	Large limb shed
53	TQ1333 5703	3.29	1.2m under burr	Maiden	Die-back. Pruning, storm damage and re-growth. Ivy stems
54	TQ1267 5636	3.54		Maiden	Fine tree, lower shading, some re-growth
55	TQ1262 5629	3.99	1.7m on fallen debris	Pollard	Dead, standing
56	TQ1258 5627	4.01		Maiden	Low branches shaded, good crown. Honey fungus in wound
57	TQ1265 5617	4.00		Maiden	Large limbs lost side and top. Die-back & storm damage
58	TQ1305 5627	4.14	1.0m waisted trunk	Maiden	Fine wide-spreading tree. Large limb shed, little die-back
59	TQ1314 5624	3.24	1.0m below large burr	Maiden	Shaded, dead branches/decay S side. Limbs shed
60	TQ1314 5621	3.50		Maiden	S side and all spreading branches shaded/dead. Ivy
61	TQ1314 5619	3.21	1.2m below burrs	Maiden	Dead limbs on S side from shading
62	TQ1308 5620	3.62		Maiden	Possibly a younger tree, buttressed. Shaded lower limbs
63	TQ1305 5618	3.11		Maiden	Possibly a younger tree. Narrow profile, shaded, epicormic
64	TQ1305 5617	3.23	1.3m over small burrs	Maiden	Upright, storm damage, many burrs. Lower die-back
65	TQ1302 5616	3.41		Pollard	Three stems from 3m, one dead from storm damage
66	TQ1304 5620	3.75	1.2m waisted trunk	Maiden	Fine spread but limbs lost from shading
68	TQ1302 5615	3.23	1.2m (fallen debris)	Pollard	Three stems from 3m. Decay NW side. Some ivy
69	TQ1284 5620	3.69	1.0m	Maiden	Leaning tree, one of pair, smaller now dead/decayed

70	TQ1285 5621	3.10		Maiden	Very shaded, much die-back, ivy, poor grid ref.
71	TQ1283 5620	3.26	1.3m	Maiden	Lower limbs lost from shading. Now an upright tree
72	TQ1282 5618	4.02		Pollard	4 stems from 2m, one dead. Shaded, storm damage, burrs
73	TQ1277 5623	3.10		Maiden	Shaded lower limbs. Wide scar to dead bough at ~4m
74	TQ1275 5623	3.31		Maiden	Lower limbs lost from shading. Now an upright tree, scarred
75	TQ1273 5622	3.13		Maiden	Good spreading tree. Surrounding holly and small oak
78	TQ1290 5604	4.10		Maiden	Fine broad-crowned tree. Storm damage low down
79	TQ1295 5595	4.34		Maiden	Large tree dividing massively at 3m. Surrounding holly
80	TQ1293 5596	4.00	1.9m above burrs	Maiden	Dead. Poor grid ref. Much holly, many ivy stems to ~5cm
82	TQ1286 5598	3.92		Maiden	Large limbs lost and surgery scars. Surrounding holly
84	TQ1295 5585	5.11		Maiden	Good spread, lower limbs dead/shaded. Hole from lost limb
85	TQ1297 5583	3.87		Maiden	Girth includes much ivy. Surrounding holly. Shaded
86	TQ1297 5590	4.19		Maiden	Lower branches lost from shading. Near SE Pond
	TQ1297 5592	3.38		Maiden	Large limbs lost and tree surgery scars. Surrounding holly
87	TQ1305 5587	3.98		Pollard	Divides at 4m. Some lower limbs lost, top OK.
88	TQ1309 5595	4.84	1.0m	Maiden	Large, dead lower limbs from shading. Now a narrow tree
89	TQ1310 5601	3.50		Maiden	Broad crowned tree, some low branch loss. Ivy stems
91	TQ1302 5601	3.94		Pollard	Massive branches. Buttressed trunk
92	TQ1301 5601	3.46		Maiden	Lower limbs lost from shading
93	TQ1305 5608	3.40		Pollard	Upright profile. Lower limbs dead from shading. Holly
94	TQ1257 5691	3.34	1.2m under large limb	Maiden	Upright profile. Lower limbs dead from shading
95	TQ1327 5634	3.65		Pollard	Many upper branches lost/storm damage. Good re-growth

96	TQ1271 5592	3.99		Maiden	Fine tree. Some lower limb shading. Fungal growth apparent
97	TQ1283 5587	4.08	1.4m under large limbs	Maiden	All lower limbs shaded and dead. Some large limbs shed
98	TQ1287 5587	3.73	1.4m under large limbs	Maiden	One huge limb lost
99	TQ1289 5582	3.20		Maiden	Lower branches dead from shading
100	TQ1293 5575	3.54	1.4m under large bulge	Maiden	Good tree
101	TQ1297 5576	3.56	1.0m below flared trunk	Pollard	Several ivy stems to ~5cm
102	TQ1298 5578	3.78	1.0m below pollard flare	Pollard	Many small ivy stems to ~5cm
103	TQ1299 5576	3.30		Maiden	Leaning tree. Many ivy stems to 5cm
104	TQ1301 5572	3.76	1.1m over buttress	Maiden	Leaning tree. Tunnel car park
107	TQ1300 5571	3.62	over unavoidable burrs	Maiden	Larger of leaning pair, suffering from compaction by car park
108	TQ1299 5567	3.73	1.0m below pollard flare	Pollard	Open situation by road. Large polypore
109	TQ1295 5570	3.19		Pollard	One large living bough. 2 of 3 boughs dead
110	TQ1295 5582	3.50	1.4m	Pollard	Narrow-profile tree. Large ~9cm ivy stem
111	TQ1293 5585	3.86	1.0m over ivy	Maiden	Leaning, substantial ivy stems
113	TQ1291 5587	4.70	1.3m below flaring limb	Maiden	Measured over 10cm ivy stems covering 1/3 of trunk
114	TQ1268 5590	3.62		Maiden	Nearly dead. Good sulphur bracket fungus
115	TQ1241 5628	3.91		Maiden	Low epicormic tree, once pruned. Merritts Cottage garden
116	TQ1241 5629	3.27		Maiden	As previous tree. Hollow, good for bats/hornets. Merritts
	TQ1264 5640	3.37		Maiden	Shading loss of limbs to N, regrowth. Holly/honeysuckle
	TQ1324 5703	3.74	1.0m under pruned limb	Pollard	Girth measured under two ~14cm ivy stems
	TQ1347 5699	4.73	1.0m	Pollard	Mostly dead, bark lost, hidden by holly. 2 large limbs survive

Birds (Alan D. Prowse)

Two common redpolls were with a small flock of lesser redpolls on the Common from 31 January to 13 February (Tim Dackus, Steve Spooner, and the SBC website). This is a first record for the Common.

On 2 May a female goshawk flew over Bayfield plain going west, and was seen by the seventeen members of Surrey Bird Club on a field trip led by ADP. Among the good birders in the group none could pick out the distinctive face pattern, so the bird was thought to be in its second calendar year. An adult breeding female would be on the nest at this date. The immaturity of this bird and the absence of records in the area suggesting breeding render it safe to publish this record.

Red kites passed through Surrey in record numbers in the first six months of the year, and those published on the SBC website exceeded 100 birds. These were analysed by ADP in the SBC Newsletter and included birds at Bookham Common on 4, 19, and 26 April, and 4 and 26 May; all were single records except two birds on 26 April.

Other notable records in the year were of a kingfisher and jack snipe on 7 February (Tim Dackus), a male yellowhammer on Bayfield on 26 February, a green sandpiper on 24 August, a whinchat around 20 August. Hawfinches were recorded on Bayfield/Central plains from 1 January to 13 March, with a maximum of eight on 7 February. A grey wagtail wintered for at least the third winter on piles of rotting manure by the allotments. A lesser spotted woodpecker was heard on Bayfield on 3 January, the only record of the year.

In the breeding season the heronry had seventeen successful nests. Little grebes nested on Ponds 1 and 3, but left mid-season. The openness of the pond surrounds led to much dog disturbance, including owners throwing sticks for the dogs among young waterfowl, and this is thought to be causative in the loss of the little grebes. Spotted flycatchers have been seen carrying food in the past two years, but the only 2009 record was of a single bird early in the season.

There are a number of buzzard pairs in the general area, and the pair near the warden's house started a nest near the heronry, but did not persist with the attempt. Sparrowhawks again nested near Bookham Station, with a second pair present in the northern part of the Common. Two pairs of kestrels were at the Common, with a probable third pair just to the north on Chasemore Farm, an increase over most years.

The first cuckoo was recorded on 4 April. This bird, distinguished by a missing tail feather, was the only bird seen over the following weeks, and ranged over the whole of the plains. Three territories of lesser whitethroat were on Central, Isle of Wight and Central Plains. Willow warblers were confined to Bayfield Plain but had five territories there. Garden warblers were late in appearing, but generally distributed by 2 May. After two years which are widely reported as being poor breeding seasons generally, nightingales had two territories.

Dragonflies and other insects Field Study Day, 4 July 2009
(Neil Anderson)

This study day has traditionally been carried out on the second Saturday of July, but as I was heading for the Highlands on that date, the study day was brought forward by one week. Holding it on the earlier date was fortuitous, as recent years have often seen unsettled conditions on the regular day, but on this occasion we were blessed with warm, sunny weather, reaching a high of 26°C.

Sixteen species of butterfly were recorded with meadow brown and ringlet the most numerous. Despite the huge influx of painted ladies in the spring only one individual was noted; similarly one each of red admiral and small tortoiseshell were seen. The latter species has undergone a dramatic decline in at least the south-east during recent seasons; possibly due in part to the arrival of a new parasitic tachinid fly, *Sturmia bella.* Research is being conducted into this. The other vanessid recorded, the comma, was seen in good numbers, about ten individuals.

Of the more localized species, *c.*15 white admirals were noted, often nectaring at bramble flowers. Also holding there own, *c.*20 silver-washed fritillaries were recorded, often sharing the same bramble bushes as the white admirals. Six purple emperors represented a good count. Away from the well-known lekking site a female was observed investigating the sallows close to Merritt's Cottage for possible oviposition.

Last year due to cool, cloudy conditions we didn't record any Anisoptera at the Isle of Wight Pond. On this year's day we were blessed with ideal conditions which resulted in several emperors, three brown hawkers, five black-tailed skimmers, a male broad-bodied chaser and some of the commoner damselflies. By the boggy area a few teneral ruddy darters were seen as well as a fully mature male in tandem with a female.

As usual southern hawker was encountered along a woodland ride. Banded demoiselles are frequently observed at Bookham, usually on the Isle of Wight Pond and two males were indeed seen. Beautiful demoiselles had not previously been recorded on a study day and is not a species often seen in the LNHS recording area, but on this day we were excited to see three males and a female on the Bayfield Stream. This follows on from sightings seen the previous month. (More details on this in my Odonata recorder's report in this issue.)

Amongst other invertebrates, the hoverfly *Xylota sylvarum* was noted. Also an immature wasp spider low in grass was found. Many of the regularly recorded Orthoptera and Coleoptera were seen, but with no surprises.

Grasshoppers and bush-crickets Field Study Day, 8 August 2009

(Sarah Barnes)

A number of members and friends attended the 2009 Grasshoppers and bush-crickets Field Study Day. The weather was very hot and sunny and it looked an excellent day for seeing and hearing Orthoptera. I was leading this Field Study Day as the incomparable Gavin Hawgood was unable to lead.

Certain bush-cricket species such as Roesel's bush-cricket *Metrioptera roeselii*, dark bush-cricket *Pholidoptera griseoaptera* and long-winged conehead *Conocephalus discolor* are always easy to see and hear at Bookham and they performed to their audience. We also saw a number of speckled bush-crickets *Leptophyes punctatissima* crawling over the brambles but as these cannot be heard by the human ear we picked these up by sight. Certain grasshopper species are always guaranteed as well and soon people were confidently telling apart meadow grasshopper *Chorthippus parallelus* and field grasshopper *Chorthippus brunneus.*

Now to the less reliable Orthoptera: the rufous grasshopper *Gomphocipperus rufus* has been found every year now on the Central Plain since 2005 having first been found in 2001. This is normally a chalk species and where it came from and why it stays on the Bookham clay is not understood but it does. As this is such an unusual grasshopper for such a site as Bookham it is worth spending some time looking for it, and it certainly made us search this year. Eventually one male was found in a patch of brambles from where it was calling. Common green grasshopper *Omocestus viridulus* has been declining on the Common but a few were found on the plains just before lunch.

After lunch, a second oak bush-cricket *Meconema thalassinum* was found by sweeping some oak trees and then we moved onto the Isle of Wight Pond area where we searched and failed to find the lesser marsh grasshopper *Chorthippus albomarginatus* but we were very successful in finding short-winged conehead *Conocephalus dorsalis*: the numbers of this species do seem to be increasing or we are getting better at finding them.

In recent years we have ended this study day with excursions to Wisley and Fairmile Commons, three or four miles away, to find Orthoptera that are absent from Bookham. Wisley Common holds good numbers of the wonderful bog bush-cricket *Metrioptera brachyptera* whose gentle chugging song could be heard throughout the site. This site is particularly noted for the presence of one of the true crickets, the wood cricket *Nemobius sylvestris* whose atmospheric song could be heard from wood piles on the open heath and in the leaf litter in a thicket of mixed trees. This gorgeous little cricket is more at home in the New Forest but the colony at Wisley is doing well and always nice to see. The day ended at Fairmile Common where the colourful mottled grasshopper *Myrmeleotettix maculatus* and striped-wing grasshopper *Stenobothrus lineatus* were found.

Additional field notes (Stuart Cole)

The following notes were made on Bookham Common survey Saturdays:

9 May. The tiny dark metallic green moth *Micropteryx calthella* was numerous on buttercup flowers beside tracks. This species belongs to the Micropterygidae, the most primitive family of the Lepidoptera and whose members are the only ones of the order to have fully functional mandibles which they use to feed on pollen. Amongst other interesting features, the wing venation of the micropterygids resembles that of some archaic forms of the Trichoptera and their larvae feed on mosses and liverworts. The family has its greatest diversity in New Zealand.

In the area of birch woodland in Western Plain we encountered several species of red and black beetles on foliage. Three species were leafbeetles: the adults and clusters of black larvae of *Gonioctena viminalis* on sallow saplings and adults of both *Chrysomela populi* and *Gonioctena decimnotata* on aspen. The distinctive weevil *Apoderus coryli* was found on hazel.

Three glow-worm *Lampyris noctiluca* larvae were found in the marshy area by the ponds.

13 June. The previous evening Paul Wheeler and I set up three light traps around the LNHS hut in the garden of Merritt's Cottage. Few moths came to my small 25-watt trap which I placed in the paddock but a good number and variety of species flew to Paul's larger 60-watt light traps. Particularly nice to see were the lobster moth *Stauropus fagi*, buff arches *Habrosyne pyritoides* and buff-tip *Phalera bucephala*. Other highlights were sharp angled carpet *Euphyia unangulata*, scorched wing *Plagodis dolobraria*, great oak beauty *Hypomecis roboraria* and a micromoth restricted to six sites in Surrey, *Epermenia falciformis*.

Wandering around the open scrub and herbaceous vegetation of the Isle of Wight Plain we came across the little longhorn *Glaphyra umbellatarum* on umbellifer flowers. This was a new beetle for me and a species recorded only twice before at Bookham. Slender, quite delicate in build, it has shortened elytra that expose the wings. Other beetles found today included the longhorns *Rutpela maculata* and *Clytus arietis*, the cardinal beetles, *Pyrochroa coccinea* and *P. serraticornis*, and the harlequin ladybird *Harmonia axyridis*. The last was I think the first of this species officially recorded at Bookham.

Of particular interest among Hemiptera found today by Tristan Bantock was the mirid *Deraeocoris olivaceous*, an Nb species, of which adults and nymphs were beaten from hawthorns, and the tree hopper *Centrotus cornutus*.

8 August. Two particularly good new species for the Common were found today: a hornet robber fly *Asilus crabroniformis* that was lingering in the vicinity of fresh cattle dung, and, on common fleabane *Pulicaria dysenterica*, a green form of the rare tortoise beetle *Pilemostema fastuosa*. The last is particularly attractive in its red form and we shall be searching for further specimens in 2010.

10 October. Paul Wheeler ran a light trap overnight at the LNHS hut. It was mild and cloudy following an evening of rain. This resulted in a good selection of autumn moths plus six worker hornets *Vespa crabro* and a few caddis-flies. The most numerous of the moths, with sixteen specimens, was the notodontid figure of eight *Diloba caeruleocephala*. This is a blackthorn specialist, although the larvae also feed on other Rosaceae. Among the other species, all noctuids except for a couple of micros, were merveille du jour *Dichonia aprilina* of which four specimens, beautifully patterned with green and white markings, green-brindled crescent *Allophyes oxyocanthae* notable for its patches of iridescent green scales, three Blair's shoulder knot *Lithophane leauteri,* a European species first recorded in the UK in 1951 and now common, chestnut *Conistra vaccinii*, satellite *Eupsilia traversa,* and both barred sallow *Xanthia aurago* and pink-barred sallow *X. togata*.

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Orb-web spiders on the Ladies Bathing Pool Meadow and elsewhere on Hampstead Heath

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Abstract 93
Introduction 93
Hampstead Heath grassland and its management 94
The Ladies Bathing Pool Meadow 94
  Vegetation 94
  Recent history of the Meadow as a habitat for orb-web spiders 95
The orb-web study methods 96
Results 97
Discussion and management implications 98
Acknowledgement 98
References 99

Abstract

Studies of large orb-web spiders on the Ladies Bathing Pool Meadow on Hampstead Heath were made in 2001–2003. Counts were made, plants used by the spiders as supports for their webs were noted, and colour variations in *Araneus quadratus* were counted. It was concluded that both *A. quadratus* and *Larinioides cornutus* had definite preferences as to where they constructed their webs (unlike *Araneus diadematus* which exhibited no particular preference for different plants), and that to some extent the colour variations of *A.quadratus* were related to the colour of the plants concerned. Unfortunately no plausible explanation for this last observation could be offered.

Introduction

Large orb-web spiders are not common in greater London today, and have not been for many years (Savory and Le Gros 1957). The common garden spider *Araneus diadematus* is widespread and is found in gardens, green roofs and on balconies even in the central area. There are recent records from balconies near Westminster Abbey and at Covent Garden. In the last few years the wasp spider *Argiope bruennichi* has also appeared at many sites where there is long grass. Other species are very much less common. The large *Araneus marmoreus* was known from Hampstead Heath two centuries ago but has not been seen for at least a hundred years. It is not mentioned by Ellison (1913).

There are many parts of Hampstead Heath which, at first sight, appear to be excellent habitat for large orb-web spiders. There are substantial areas of tall herbs, many bramble patches, and areas of mature gorse. Before 1991 there were few records of orb-web spiders on the Heath apart from *A. diadematus* and two common species of *Metellina, M. mengei* and *M. segmentata*. Even *Tetragnatha* spp. are not common: none are mentioned for the whole of London by Savory and Le Gros, although in the last twenty years one or two individuals of four species, *T. extensa, T. montana, T. obtusa* and *T. pinicola*, have been swept from the waterside vegetation around some of the Hampstead ponds.

During a visit to various meadows on Hampstead Heath in September 1991 a single rather undersized female of the large orb-web spider *Araneus quadratus* was swept from the patch of tall herbs in a damp area near the centre of the Ladies Bathing Pool Meadow (referred to henceforth as the Meadow). This was the first record of this spectacular spider from the Heath. During the 1990s a colony developed on the Meadow, and gradually spread to patches of *Juncus effusus* on two adjacent meadows. In 1997 a separate colony was found in a large patch of rosebay willowherb *Chamerion angustifolium* at the south end of the Hampstead Heath Extension, but the spider has not been seen there since.

Two other species of orb-web spider, *Larinioides cornutus* and *Neoscona adianta,* were first recorded from the Heath in 2001, both from the Meadow, and the former has since been found in adjacent areas of the Heath, the latter only once more, also on the Meadow. In 2002 the first recorded specimens of the wasp spider *A. bruennichi* on the Heath were seen on the Meadow. In subsequent years a few individuals have been seen at scattered sites around the Heath.

Between 2001 and 2003 detailed surveys of the Meadow were made to count the populations of larger orb-web spiders and to assess the effects of major changes in the management of the Meadow.

This is an account of those surveys, together with some comments about the implications for the management of such areas.

Hampstead Heath grassland and its management

For many years up to around the mid 1990s most of the grass areas of Hampstead Heath were machine mown two or three times every year, and often the cut grass was left to decompose and refertilize the soil. This treatment removed all grass tussocks, any anthills and other surface irregularities, and as the mowing was frequently done in damp conditions it caused rutting and compaction of the soil. It encouraged further trampling by the public and their dogs, and additional nutrients from dog urine and faeces also contributed to change the soil conditions. This combination of factors has been shown in various places to result in a coarsening of the sward, a reduction in plant and invertebrate diversity, and a standardization of the habitat. Such effects can be observed in many public open spaces in urban areas including near main paths on some parts of Hampstead Heath. The author has discussed this in some detail previously (Milner 2006).

While the extensive area of Hampstead Heath makes it most unusual for an urban park, the management of the grassland areas for many years meant that the habitat was not good for grassland specialists of any sort, vertebrate or invertebrate, some of which are now locally extinct. Prior to the heavy mowing regime there must have been numerous anthills; by the early 1990s there were very few anthills anywhere on the Heath, and spiders associated with ants, such as *Zelotes latreillei,* were absent. In many places native grasses like fescues and bents had been gradually overwhelmed by more vigorous species. It is claimed that there were six species of ground-nesting birds on the Heath as recently as the 1960s but by the 1990s none was recorded. There was virtually no long grass anywhere on the Heath that was not mown at least once in the autumn.

The Ladies Bathing Pool Meadow

Vegetation

The Meadow, mostly on a substrate of London Clay but with a small area in the north-west on Claygate Beds, slopes from west to east towards the Bathing Pool and the Bird Sanctuary. It has a dense sward of several common grasses including fescues *Festuca* spp., bents *Agrostis* spp., meadow grass *Poa* spp. and Yorkshire fog *Holcus lanatus* as well as some perennial rye-grass *Lolium perenne*, tussocks of cocksfoot *Dactylus glomeratus* and, in the south eastern corner some false oat-grass *Arrhenatherum elatius.* There are also some patches of timothy *Phleum pratense*. Creeping thistle *Cirsium arvense* is common in some parts of the meadow, and, in some areas, especially along the line of a gas pipeline, the sward is dominated by common rush *Juncus effusus*.

Around the edge of the meadow there are substantial areas of bramble *Rubus fruticosus* agg. and there is one small patch near the middle of the Meadow just north of the central damp area. Other plants which are common in the sward are sorrel *Rumex acetosa* and white clover *Trofolium repens.* Less common are lady's bedstraw *Galium verum*, tufted vetch *Vicia cracca*, heath bedstraw *G. saxatile*, and in one area occasional plants of broad-leaved helleborine *Epipactis helleborine.*

The damp area near the middle of the Meadow is caused by an intermittent spring, and the vegetation includes a patch of yellow flag *Iris pseudacorus* about five metres across, and a larger area dominated by common rush *J. effusus*, with some stinging nettle *Urtica dioica*, sorrel *R. acetosa*, curled dock *R. crispus*, meadow buttercup *Ranunculus acris*, common ragwort *Senecio jacobaea* and water mint *Mentha aquatica.* There is a single ash sapling *Fraxinus excelsior.*

In 1992 a gas pipeline was laid across the western side of the Meadow and the disturbed ground reseeded with a grass and wildflower mix. The disturbed ground, along the whole length of the pipeline, was also much colonized by common rush *J. effusus*. Some of the flowers have persisted, in varying numbers. In particular, lady's bedstraw *Galium verum*, ox-eye daisy *Leucanthemum vulgare*, red clover *Trifolium pratense* and hardheads *Centaurea nigra* are still present today (2009), as well as occasional musk mallow *Malva moschata.*

Recent history of the Meadow as a habitat for orb-web spiders

Apart from *Araneus diadematus,* the specimen of *A. quadratus* found in 1991 was the first modern record of any large orb-web spider from the entire Heath. At the time intensive searching failed to reveal any further specimens of *A. quadratus* or any sign of their characteristic webs. At that time most of the Meadow was machine-mown, the small area of uncut tall herbs being as small as about twenty metres in diameter. Being one of the few areas of long grass in the public meadow areas, the patch of common flag, nettles and common rush was also subjected to much disturbance and trampling by dogs and their owners. Sticks were frequently thrown into the area for dogs to find. It was not a suitable habitat for large orb-web spiders which need relatively undisturbed conditions.

In late 1992 a gas pipeline was laid across the Heath, partly across the Meadow, and following these works some reseeding was done. The following summer, partly as a result of spider survey work undertaken by the author in various parts of the Heath, it was suggested that the habitat on the Meadow could be greatly improved if the mowing was restricted. A proposal was put forward to leave a much bigger area uncut creating a buffer zone of at least twenty metres all round the existing area of tall herbs. Instead the Heath management went one better and decided not to cut any of the Meadow at all except for the two or three main 'desire lines' or informal paths made by the public.

In the years following, it became apparent that the trampling and disturbance was greatly reduced in the damp area, and orb-webs appeared among the tall herbs. Across the whole Meadow some tall herbs began to grow and tussocks of cocksfoot developed. Subsequently, creeping thistle increased considerably in the southern half of the Meadow and many of these robust plants were seen to be used by orb-web spiders. Around the turn of the millennium quite a number of orb-webs, including some produced by *A. quadratus,* were observed on the Meadow. Numbers of *Larinioides cornutus* webs also increased although numbers of *A. diadematus* did not appear to be any more frequent than before. In 2002, two individuals of the wasp spider *Argiope bruennichi* appeared among common rush near the damp part of the Meadow, but was not seen on the Meadow in 2003. A few individuals have been seen in subsequent years but not from the Meadow.

Between 2001 and 2003, various studies of grassland spiders on the Heath were commissioned by the Corporation of London (now City of London). As a result of the increased numbers of large orb-webs on the Meadow, it was thought appropriate to make a detailed investigation at first to assess how far the changes in management had affected the populations of all large orb-web spiders.

The orb-web study methods

In each of the three years 2001–2003, during early September, the entire Meadow was investigated and every orb-web checked and the identity of the spider inhabiting it noted (Table 1). In 2001 the plants to which each web was attached were also noted. In 2002 a cursory examination suggested that the pattern was very similar and so this was not repeated, but these details were collected again in 2003 (Table 2).

There was considerable variability in the colour and markings of *A. quadratus* which was not found in *A. diadematus*. Because of this, in each of the three years a subjective assessment of the colour of each *A. quadratus* spider was noted, as well as the identity of the plants to which the webs were attached (Table 3), and the results from the three years aggregated (Table 4).

TABLE 1. Large webs on Ladies Bathing Pool Meadow 2001–2003.
( ) brackets indicate unoccupied webs.

Spider species	**2001**	**2002**	**2003**
A.diadematus	30	30	7
L.cornutus	35	35	5
A.quadratus	128	158	91 (+7)
N.adianta	3	3	0
A.bruennichi	–	2	0
	196	228	103 (+7)

TABLE 2. Occupied webs and plants for 2001 and 2003.
2001 in brackets, 2003 no brackets.
Others = mint, iris, rosebay willowherb, ash (sapling), knotgrass, ox-eye daisies, hardheads.

Spider species	**Sorrel**	**Grass/ sedge**	**Thistles/ knapweed**	**Nettle**	**Bramble**	**Rush**	**Other**	**Total 2001**	**Total 2003**
A.diadematus	(12) 1	(6) 1	(2) 4	(3)	(3)	(2)	(2) 1	(30)	7
L.cornutus	(3) 4	(25)	(3)	(2)	(-) –	–	(2) 1	(35)	5
A.quadratus	(15)35	(11) 1	(35) 26	(6) 1	(14) 15	(38) 12	(5) 1	(124)	91
N.adianta						(3)		(3)	
A.bruennichi		(2)						(2)	
								193	103

TABLE 3. *A. quadratus*: estimated colour variation of individuals on different plants (three years, 2001/02/03).

Colour	**Sorrel (dead)**			**Grass/sedge**			**Thistles/ knapweed**			**Nettle**			**Bramble**			**Rush**			**Other**		
(year)	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Yellow/green	1	0	0	5	0	0	15	0	12	4	0	0	5	0	6	4	0	1	2	0	0
Reddish/brown	13	11	20	6	0	0	4	11	2	2	0	0	0	1	0	7	5	1	0	6	1
Orange	1	0	16	0	0	0	1	5	0	0	0	1	9	29	2	5	11	1	1	4	0
Brownish or greyish green	0	3	44	4	0	0	16	7	5	0	0	0	0	6	0	0	20	0	0	4	0

TABLE 4. *A. quadratus*: aggregates of colour variations on different plants for three years.

Colour	Sorrel (dead)	Grass/ sedge	Thistles/ knapweed	Nettle	Bramble	Rush	Other	Total
Yellow/green	1	5	27	4	11	5	2	55
Reddish/brown	**44**	6	17	2	1	13	7	90
Orange	17	0	6	1	**40**	17	5	86
Brownish or greyish green	**47**	4	28	0	6	25	4	114
Totals	109	15	78	7	58	60	18	345

Results

1. Common garden spider *Araneus diadematus*

The observations on the Meadow show a rising population between 2001 and 2002 with a drop in numbers to about a third in the very dry summer of 2003. This spider seems to be fairly adaptable and some webs were found attached to most of the taller plants in the Meadow, with the only apparent preference being to sorrel in 2001. It was the only large orb-web spider found on shaded bramble around the edge of the Meadow. Elsewhere on the Heath it is usually found on bramble.

2. *Araneus quadratus*

This is the heaviest British spider (Harvey et al. 2002) and it requires strong plants to support the webs. It is generally found on rough grassland, heather or gorse, with a possible preference for damp situations.

On the Meadow, during the three years of the survey, this species was by far the most abundant orb-web spider. Numbers were somewhat reduced in the dry third year but less so than *A. diadematus* and *L. cornutus*.

A. quadratus showed a strong preference for some plants. As Table 2 shows, in 2001 it was most frequently found on thistles and common rush, less frequently on sorrel, bramble and grasses, and much less frequently on other plants. In 2003 it was more abundant on sorrel, less so on thistles, bramble and common rush. When figures for the two years are aggregated the overall preferences were sorrel 109, thistles 78, common rush 60, bramble 58 and all others combined 40.

The colour variation noted in 2001 was investigated in detail, with two main limitations: (1) there was clearly a subjective element in the estimation of colour by the author, and (2) some spiders were of intermediate colour. However, accepting these considerations some of the figures are striking; they have been highlighted. It appears that for around fifty per cent of all the individual female spiders their colour is associated with the plants to which their webs are attached; orange spiders were more frequently found on bramble, dark reddish-brown spiders on dark red sorrel, greenish spiders on thistles, and brownish-green spiders also on sorrel.

No obvious explanation for these observations is evident. Were the spiders this colour when they selected the place to spin their webs? Or did they somehow adapt their colour once the web was spun? There are obvious advantages in some of the colour variation; on sorrel in September a reddish-brown spider is well-camouflaged, but an orange spider on bramble? Greenish spiders would certainly seem to be best camouflaged on thistles and common rush.

Further study of this phenomenon is clearly needed.

3. *Larinioides cornutus*

This spider is known to occur most commonly on tall grasses, reeds and other waterside vegetation as well as on rough grassland (Harvey et al. 2002). On the Meadow it first appeared in 2001 when there were more webs than of *A. diadematus,* 35 as compared with 30, and like that species the numbers in 2002 were the same, while in 2003 the numbers dropped to just five.

In 2001 the overwhelming majority of *L. cornutus* webs were on tall grasses, mostly cocksfoot and tall oat-grass, but in 2003 none could be found on tall grasses anywhere in the Meadow, the few webs that did exist were mostly on sorrel.

Discussion and management implications

The main conclusion reached was that by allowing tall herbs to grow, especially tall thistles and common rush as well as grass tussocks, a habitat suitable for large orb-web spiders has developed on the Meadow, benefiting in particular *A. quadratus* and *L. cornutus.* Both these species have built up a population and have since spread a little way out from the Meadow onto similar undisturbed areas of adjacent meadows (Tumulus Field and Stock Pond Meadow). Shaded bramble scrub, such as that around the edges of the Meadow, did not attract these spiders, although it was still popular with *A. diadematus.* The small area of bramble in full sun out in the middle of the Meadow, just north of the damp area, has provided a suitable habitat for *A. quadratus.*

The increased area of creeping thistle has benefited these spiders, and the use of tall flowering stems of the larger grasses, especially cocksfoot and tall oat-grass, benefited *L. cornutus* in particular. One drawback is that large areas of thistles are not very attractive to visitors.

These findings do suggest that the general paucity of these spiders elsewhere on the Heath, including the Heath Extension, is partly due to inappropriate management, in particular the mowing of tall grasses and removal of other tall herbs in full sun.

The general level of disturbance in a large open space within an urban area is such that there will always be some pressure on large orb-web spiders which make their homes in tall herbs growing in meadowland. People and dogs will still damage or destroy webs to some extent, and it is unrealistic to expect such areas to be kept completely undisturbed.

This study shows that there must be other important factors involved. The numbers of all orb-web spiders decreased considerably in the very dry summer of 2003, and many individuals of *A. quadratus* were estimated by the writer to be smaller than usual, although no measurements were made. The limited data collected here were also inconsistent; the preferences of these spiders differed in the years studied. Why would this be so? What makes sorrel more popular with *A. quadratus* than common rush one year but not during a subsequent year? The only suggestion that the author has to explain this could be that in a good year with a lot of flying insects available as prey perhaps the spiders tend to spin their webs on taller or stronger plants so as to support their own greater weight.

Further study along the same lines in successive years would be valuable, and if each spider could be weighed that would add interesting data to test the hypothesis in the paragraph above. Technically this may prove difficult; a search of the literature does not reveal any research involving the weighing of live spiders. Those researchers interested in assessing size differences (Edwards 1996, and Hoye et al. 2009) have all worked with preserved specimens.

Acknowledgement

I would like to thank Meg Game for her help with details of the vegetation on the Meadow.

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Book review

Wasps of Surrey. David W. Baldock. Surrey Wildlife Trust. 2010., 335 pp., 48 coloured plates. Hardback. ISBN 978 0 9556188 2 6. £18, plus £2.70 p. & p. from Atlas Sales, Surrey Wildlife Trust, School Lane, Pirbright, Woking, Surrey GU24 0JN; tel. 01843 795488; cheques payable to Surrey Wildlife Trust.

This final volume of a trilogy of works on aculeate Hymenoptera in the authoritative and superbly produced *Surrey Wildlife Atlas Project* series complements David Baldock's 2008 volume *Bees of Surrey*. The 117-page introduction mirrors that of the bee volume, citing appropriate data and examples under similar headings so that the two volumes are independent. The balance of the volume comprises species accounts of 208 solitary and social wasps, 88 per cent of the British fauna, with distribution maps compiled from *c.* 45,000 modern and historical records, plus thirty-four species of the little-recorded Dryinidae, Embolemidae and Bethylidae. Modern coverage has been much enhanced by having four core recorders dwelling across the county.

A key to families of aculeates by Graham Collins is prefaced by a list of features to eliminate other Hymenoptera.

The species accounts state the national and local status of each and list typical locality data. Nesting habits and habitat preferences are described and tips on difficult identifications are given. Distribution maps by tetrad follow the format of the series.

Appendices give a gazetteer of sites, references, a glossary and list of acronyms, an index of plants listed by common names, and some useful addresses. A page index of species in generic order doubles as a useful checklist. Finally there is a list of published volumes of the Surrey Wildlife Atlas series.

Forty-eight plates of excellent colour photographs, mostly of live wasps, many with prey, give the newcomer a fine overview of the variety of solitary wasps and their fascinating behaviour. One plate shows fossils of spider-hunting wasps found in Surrey clay pits.

Covering all but a minority of northern and coastal wasps, this volume must be of great value to naturalists across the whole of the UK.

Raymond Uffen

London's changing bryophyte flora

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This article, on changes which have taken place in London's bryophyte flora since the nineteenth century, first appeared in Field Bryology, *No. 98, June 2009, and it is obviously of interest to all who are concerned with London's natural history. We are grateful to Jeff Duckett and Silvia Pressel, and to Ian Atherton, the editor of* Field Bryology, *for permission to reprint it.*

* * *

'When a bryologist is tired of London, he / she is tired of life!'

'Well, that may not be exactly what Samuel Johnson said, but based on the following account of London's bryoflora by Jeff Duckett and Silvia Pressel, it is doubtful that any bryologist would ever grow weary of studying bryophytes in this great city.'

The London one of us (JGD) first knew in the 1960s was a pretty mucky place. High sulphur dioxide and soot deposition since the 19th century had wiped out all but a handful of the most hardy epiphyte species (Table 1). In fact, quantitative measurements of tree trunks in relation to the incidence of melanism in bark-resting moths (Creed et al., 1973; Lees et al., 1973) revealed that London, at that time, had grimy almost lichen-, *Pleurococcus*- and bryophyte-free tree bark on a par with that around the satanic mills of northern England. Habitat destruction also played a not insignificant part in the decline in London's bryophyte diversity. Increased urbanization, the loss of chalk habitats in the west, the spread of golf courses and, in particular, the drying out of wetland habitats saw the loss of several sphagna since the records by Benbow in the 19th century and Richards in the 1920s. Bryologists living in London had frankly given up and whenever possible headed out of Middlesex into the more promising pastures of Sussex, Kent and Surrey, outside London's conurbation. The 19th century's extinctions, particularly amongst epiphytes, were accepted as extinctions and there seemed to be little point in trying to refind them. Wallace (1955), in his classic account of Boxhill bryophytes (Duckett, 2008a), mentions *Orthotrichum lyellii* as a declining species in the Home Counties, a situation closely in line with the absence of recent records in south London in Gardiner's Surrey flora (Gardiner, 1981). However, the Clean Air Acts of 1956 and 1968 did point to hope for the future, and so this has proved to be. The late 1980s and 1990s saw a crop of new epiphyte records on Hampstead Heath until, in 2009, almost every epiphytic bryophyte recorded from the Home Counties can be seen within the London conurbation less than fifteen miles from Charing Cross (Table 1). Alongside this resurgence of interest in London's epiphytes, exploration of just about every other conceivable bryophyte habitat in the greater London area has led to new discoveries — some obvious gap fillers, but others a complete surprise.

The aim of this account is to chart the major changes in London's bryophytes since the nineteenth century, and particularly in the present century explore the likely provenance of new records and speculate on the future. Nomenclature follows the new *Census Catalogue* (Hill et al., 2008), which reveals that the London area is bedevilled with old records of readily recognizable taxa that lack vouchers. In this account we indicate which of these are still likely to occur, having in many cases persisted since the nineteenth century, and which are the more likely extinctions.

We also detail some novel and interesting facets of the biology of some of the London bryophytes that our recent exploration of the metropolis has revealed. Since the last account of Middlesex bryophytes (Kent, 2000), there have been

TABLE 1. Changes to the epiphytic and rotten wood bryophyte flora of the London area from the nineteenth to the twenty-first century. NW, north west fringes; C, within the conurbation.

Species	19th Century Records	1900–1949	1950–1979	1980–1989	1990–1999	2000–present	Probable history
Frullania dilatata	1862, 1886, 7, 1892–4, 8 all NW			1983, 9 NW, 1983 C		Now frequent C & NW	Extinction and recolonization
Cololejeunea minutissima						2006, 9 NW	New arrival
Lejeunea cavifolia	1894 NW						Extinction
Lophocolea semiteres						2009 C	New arrival
Microlejeunea ulicina						2005 C 2008 NW	New arrival
Metzgeria consanguinea					1996 NW	2007C	New arrival
M. violacea					1996 NW	2007 C	New arrival
Nowellia curvifolia						2008 NW	New arrival
Porella platyphylla	1886,7, 1890, 3, 4 all NW	1926–8 F					Extinction but rediscovery likely
Radula complanata	1861, 9, 1874, 1889, 1891, 3, 4, 7 all NW				1996 NW	2005 C, now frequent C & NW	Extinction and recolonization
Bryum moravicum				1980, 2, 4 all NW	1991, 3, 5 all C 1992, 4, 5, 7, all NW	2008 NW	New arrival or previously overlooked
Cryphaea heteromalla	1721, 2, 1762, 1863, 1877 all NW			1980, 2, 4 all NW	1991, 5 all C	2008 NW, now frequent C & NW	Extinction and recolonization
Dicranum flagellare	1885, 1892, 4 all NW	1927, 1949 NW	1961 NW	1981–3 NW	1992, 4, 5 all NW		Persistent. No suitable habitats centrally
D. montanum	1894, 9 NW	1927 NW	1961 NW	1980, 2 NW	1991–5 NW	2005 C	Persistent, recent extension centrally
D. tauricum		1937 NW, (Surrey 1944)	1961 NW	1981, 3 NW	1992, 3, 5, 6 NW	2005 C, now frequent C & NW	Persistent, recent extension centrally

Grimmia pulvinata				1989 C	1991 C	2002 C, now frequent C & NW	Persistent as a saxicole, recent as an epiphyte
Herzogiella seligeri						2009 C	New arrival or previously overlooked
Homalia trichomanoides	1874, 1886, 1891–3 all NW	1964 NW					Possibly extinct but rediscovery likely
Orthotrichum affine	1863, 1886, 1894 all NW			1981, 3 NW 1987 C	1992, 4, 7 NW	Now frequent C & NW	Extinction as an epiphyte followed by recolonization
O. diaphanum	1886, 1892, 4 all NW		NW & C	NW & C	NW & C	Now frequent C & NW	Persistent
O. lyellii	1841,1894, 6 all NW	1925, 1945 NW	1959 NW		1992, 4, 6 NW 1992 C	Now frequent C & NW	Probable extinction, at least centrally and recolonization
O. pulchellum					1992 NW	2005 C 2008 NW	New arrival
O. stramineum						2009 NW	New arrival
O. striatum				1989 C	1990, 3, 5 C	2008 C	New arrival
Platygyrium repens						2008 NW	New arrival
Syntrichia laevipila	1886, 1891, 3, 7 all NW	1907, 1922, 3, 1945 all NW	1950, 2, 9, 1979 all NW	1982 NW	1993, 7 NW 1995 C	2004 C, now frequent C & NW	Persistent, recent extension centrally
Syntrichia laevipila var. *laevipiliformis*						2009 C	New arrival, one previous record on wall in 1967
S. papillosa	1895, 1892, 6 all NW					2007 C 2008 NW	Extinction and recolonization
Ulota bruchii				1989 C	1992 NW 1993, 4, 6 C	Now frequent C & NW	Extinction and recolonization
U. crispa	1861 NW	1928 F		1989 C	1992–6 NW	Now frequent C & NW	Extinction and recolonization
U. phyllantha					1991 C	2007, 8 NW	New arrival?
Zygodon conoideus						2004 C, 2008 NW	New arrival?
Z. viridissimus	1891, 3, 4 all NW	1927, 1945 NW	1971 NW	1983, 9 NW masonry	1993 NW 1994 C, wall	2008 NW 2008 C	Persistent as a saxicole, recent as an epiphyte

no fewer than 34 new vice-county records (NVCRs) (Table 1) for Middlesex (eight liverworts and 26 mosses), and for Hampstead Heath alone the bryophyte flora now numbers 134 species. This is an addition of 12 liverworts and 31 mosses to the total of 91 recorded by Rieser (1998), and a remarkable total given its size and urban location, and when compared to the 151 species recorded from the town of King's Lynn (Stevenson and Hill, 2008).

A brief history of London bryologists

Elinor Wiltshire and Len Ellis (1995) give a delightful historical account of bryological activities in north-west Middlesex, i.e. along the north-west rural fringes of the conurbation, embracing various commons, woods, the only chalk outcrops in the county and the western boundary marked by the Grand Union Canal. Following extensive recording by John Benbow in the late nineteenth century, there was a gap of more than twenty years before Paul Richards (1928) published a comprehensive study, based on his fieldwork from 1920 to 1927. He refound many of the nineteenth century records, added several new species (e.g. *Gymnocolea inflata, Brachytheciastrum velutinum, Bryum caespiticium* and *Dicranum bonjeani*) and recorded many that have subsequently disappeared (e.g. *Ptilidium ciliare, Bartramia pomiformis, Calliergon giganteum, Fissidens adianthoides, Philonotis fontana, Plagiomnium rostratum, Sphagnum compactum*) or are now considerably rarer (e.g. *Aulacomnium palustre, Calliergon cordifolium*). As is clearly apparent from Table 1, the next 30 years saw little or no further recording, apart from the additions of *Dicranum tauricum*, by F.E. Milsom in 1937, and *D. majus* by Francis Rose and Ronald Boniface in 1949, both from Ruislip. It was not until the 1980s that Jack Gardiner, having completed his Surrey flora (Gardiner, 1981), turned his energies to Middlesex; as with earlier workers, these were mainly focussed on the western fringes. His most surprising discovery was *Lophozia perssonii* in the Springwell chalk pit in 1981. A further notable find in 1981 was *Leptodontium gemmascens* by P. Driver at Enfield. Unlike *L. perssonii* that still persists at Springwell, this moss has never been refound. By 1984, Jack Gardiner reckoned that the western half of the county had been fairly well worked, but that there was still quite a lot to do in the eastern half, including Hampstead Heath, and that it would take another year to complete the county flora. Sadly, his failing health left his dreams unfulfilled and it was left to succeeding bryologists to continue the London story. Since Jack's death in 1989, Elinor Wiltshire has retrod the same paths as Benbow in the north west, whilst Christine Rieser and Ken Adams found Hampstead Heath to be a veritable treasure trove of bryophyte biodiversity (Rieser, 1998).

Saxicolous species

Apart from a rapidly increasing frequency of *Orthotrichum anomalum, Didymodon vinealis,* and *Syntrichia intermedia* since 2000 [all three are recorded as rare or local by Kent (2000)], on gravestones, old walls and masonry in fairly exposed situations, the most notable additions to these habitats (typically colonized in London by *Amblystegium serpens, Brachytheciastrum velutinum, Bryum capillare, B. radiculosum, Grimmia pulvinata, Hypnum cupressiforme, Rhynchostegium confertum, Schistidium crassipilum* and *Tortula muralis*) are *O. cupulatum, O. rupestre* and *Zygodon viridissimus*, and surprisingly the more typically epiphytic species *Z. rupestris* (Fig. 1b, c). The recent records for *Homalia trichomanoides* and *Anomodon viticulosus* are both from an old concrete wall (Table 1). *Porella platyphylla*, last seen in 1961 but without voucher, is also likely to be found in this habitat, but *Pseudocrossidium revolutum* is remarkably uncommon in London. Given the recent records of *Leucodon sciuroides* on walls and tombstones in nearby south-west Surrey, where it was last seen in 1895, this species must now be considered as a likely recolonist in London in the near future. *Racomitrium aciculare*, introduced on gritstone boulders used for landscaping in about 2000, continues to thrive and produce sporophytes in Mile End Park.

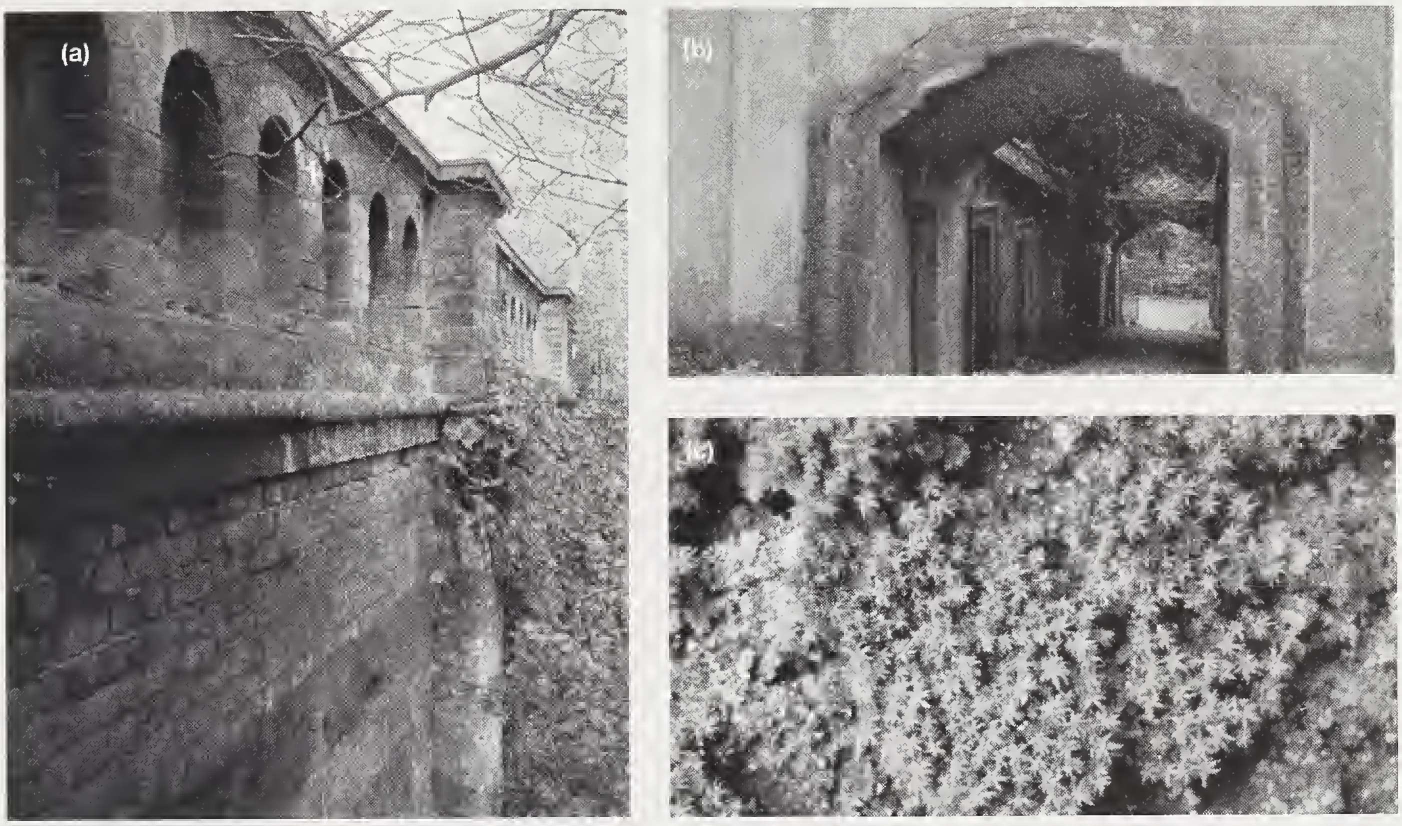

FIGURE 1. *Saxicolous species.* (a) The Bird Bridge, Hampstead Heath. Crevices in the brickwork harbour *Gymnostomum viridulum*, whilst ivy in the dell below supports epiphyllic *Metzgeria violacea*. (b) Entrance to the Egyptian Avenue, Highgate Cemetery West with *Zygodon rupestris* growing on the columns, shown in (c). *Photos: J. G. Duckett*

Damp, shaded stonework, including that along canal banks, was a habitat well-scrutinized by bryologists at the end of the twentieth century. Since Fred Ambrose found *Didymodon umbrosus* along the Grand Union canal at Cowley Lock in 1977, Jack Gardiner, Monica Milne-Smith and Ken Adams discovered this species in several other localities all over London. In contrast, the only record for *Leptobarbula berica* in v.-c. 21 remains that by Jack Gardiner and Monica Milne-Smith from Hampton Court in 1977, and *Gyroweisia tenuis* has only been refound near an old locality as recently as 2007 (Table 2). Against this background, it came as a complete surprise when microscopic examination of similar-looking plants on damp, shaded stonework and masonry from Highgate Cemetery West (Fig. 1a) revealed these to be *Gymnostomum viridulum*, immediately recognizable from its highly characteristic protonemal gemmae (Fig. 2a–e). In contrast to the gemmae in the vast majority of the Pottiales examined to date that lack abscission cells (Duckett et al., 2004), these are a constant feature of *G. viridulum*.

The discovery of *G. viridulum* far outside its previous British range (Hill et al., 1992) poses two questions: was it overlooked or is it a recent arrival, perhaps associated with climate change? The latter now seems the more likely. Subsequent to its discovery in Highgate Cemetery West, it has now been found in several likely '*Gyroweisia*-ish' spots on Hampstead Heath (Fig. 1a), including a population with abundant sporophytes in the Hill Garden. In 2008, it also turned up in the ornamental garden in Regent's Park. It is very unlikely that Elinor Wiltshire overlooked it when she recorded *Didymodon tophacea* from the same place in 1997.

Hard standings and old tarmac in London have also witnessed major recent changes in their bryophyte floras. These now support what might best be described as a veritable 'syntrichietum' with vigorous swards of *Syntrichia*

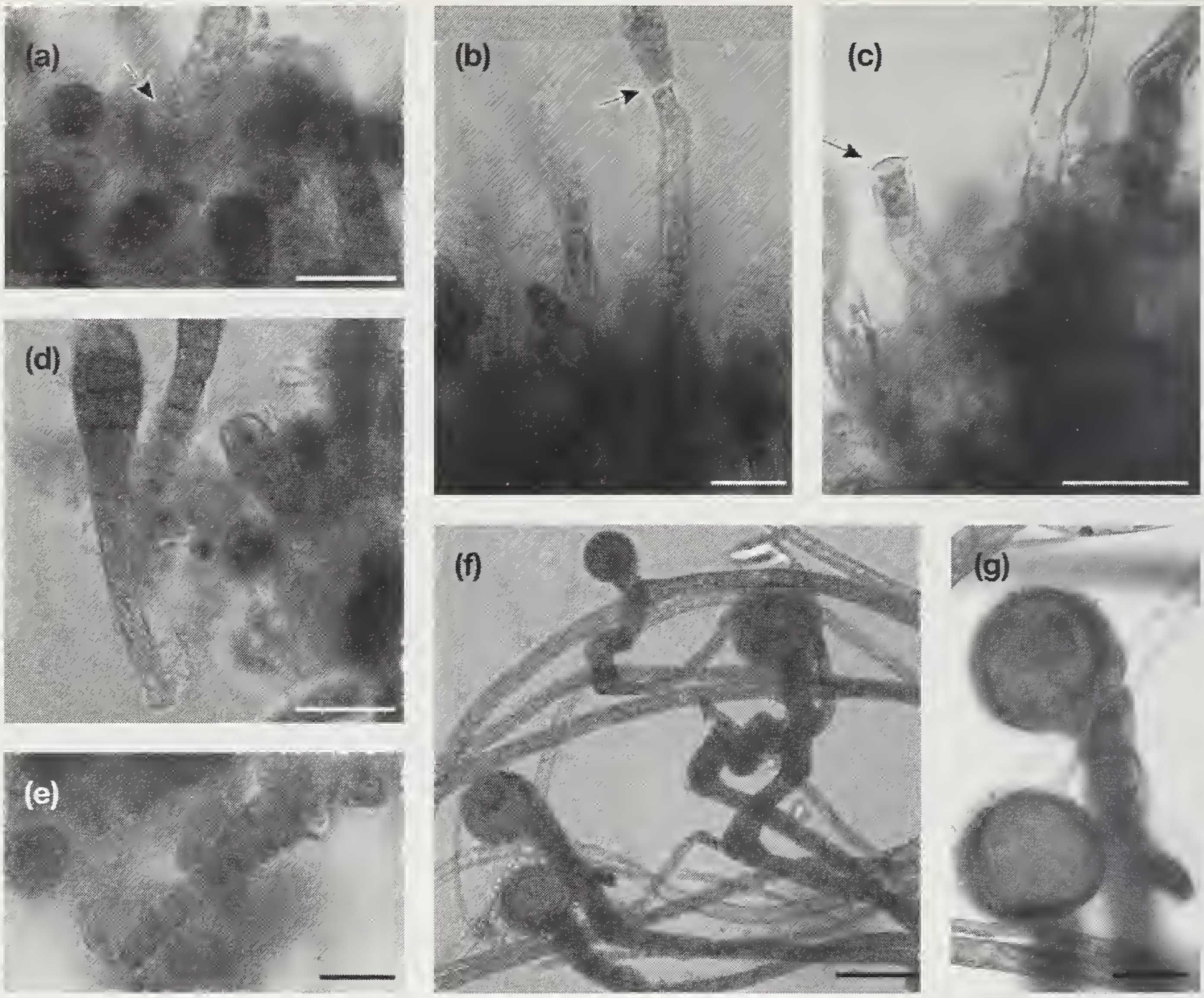

FIGURE 2. Light micrographs of *Gymnostomum viridulum* (a–e) and *Fissidens fontanus* (f, g). (a–e) Gemmiferous protonemata of *G. viridulum* from Highgate Cemetery West. (a) Swollen apical cell of an upright chloronemal filament that will subsequently develop into a gemma. Abscission cell is arrowed. (b) Gemma with its abscission cell (arrowed) on the point of rupture. (c) Scar remaining (arrowed) after gemma liberation. Also note the elongate abscission cell in the filament on the right. (d, e) Mature gemmae with pigmented walls and acuminate apices. (e, f) *Fissidens fontanus,* Regent's Canal, Mile End with the apices of the main rhizoid axes infected with rostellopsid fungi. Bars, (a–e, g) 50 μm; (f) 100 μm.
Photos: Silvia Pressel

montana, *S. ruralis* var. *ruralis* and intermediates with var. *ruraliformis*. Also frequent are *S. latifolia* and *Didymodon nicholsonii*, both previously recorded almost exclusively from riverine habitats. Ken Adams' prophecy (Kent, 2000) that *S. virescens* might be present in Middlesex but had not yet been recorded came true with its discovery in December 2008 on old tarmac in the grounds of the Orthopaedic Hospital in Stanmore. Since then, we have found eight additional and seemingly highly unlikely localities in north London, including the footpath by the A1 at Scratchwood, Hugo Road in Islington (only two miles from King's Cross) and in Carlton Square in the East End. Most recently, it has been found in south London on old tarmac in Streatham near the main Brighton road, new to Surrey. Whether or not *S. virescens* is a recent arrival in London is an open question, as is how it gets to new localities since sporophytes are extremely rare and vegetative propagules are unknown in Britain, although the latter have been reported from elsewhere in Europe (Hill et al., 1992). Since *in vitro* studies have revealed the production of asexual propagules in many mosses where these are unknown in nature, e.g. several species of *Bryum* (Pressel et al., 2007), we are currently cultivating *S. virescens* for further study.

TABLE 2. New records for Middlesex (v.-c. 21) since Kent's flora (2000).

Species	Habitat	Locality	Date and recorder	Probable origin
Cololejeunea minutissima	Epiphyte	Harefield Place	2006 J. O'Reilly & T. Blackstock	Recent arrival
Conocephalum conicum	Wall of pond	Bushy Park	2008 M. C. Sheahan	Reconfirmation of record from 1981
Microlejeunea ulicina	Epiphyte	Trent Country Park	2004 A.J. Harrington	Recent arrival
Nowellia curvifolia	Decorticared log	Stanmore Common	2008 JGD	Recenr arrival
Lophocolea semiteres	Birch tree trunks	Hampstead Heath	2009 JGD	Recent arrival
Sphaerocarpos michelii	Bare soil	Hampstead Heath	2000 record collected in 1998 C. Bowlt	Recent arrival
Riccia glauca	Arable field	Near Harefield	2007 JGD	Previously overlooked
R. sorocarpa	Arable field	Near Harefield	2007 JGD	Previously overlooked
Anomodon viticulosus	Old concrete wall	Moat Mount	2009 JGD & M. C. Sheahan	1955 record from v.-c. 21
Archidium alternifolium	Stony path	Hampstead Heath	2006 JGD	1894 record from v.-c. 21
Bryum subapiculatum	Bare soil	Trent Country Park	2006 A.J. Harrington, M. C. Sheahan & J. Wibraham	Previously overlooked
Cinclidotus fontinaloides	Stonework by Thames	Penton Hook	2009 JGD	Reconfirmation of previous records from the 1950s and 1960s
Ephemerum minutissimum	Bare soil	Pymme's Brook, Southgate	2009 JGD	1919 record from v.-c. 21
Gymnostomum viridulum	Damp stonework	Highgate Cemetery West	2004 JGD	Recent arrival
Gyroweisia tenuis	Damp stonework	Springwell Lock	2007 JGD	1893 record from v.-c. 21
Homalia trichomanoides	Old concrete wall	Moat Mount	2009 JGD & M. C. Sheahan	1926 record from v.-c. 21
Herzogiella seligeri	Decorticared log	Hampstead Heath	2009 JGD	Recent arrival or prevously overlooked
Isothecium alopecuroides	Tree base	Church Wood,Trent Park	2006 A.J. Harrington	1927 record from v.-c. 21
Orthotrichum cupulatum	Stonework	Highgate Cemetery West	2008 JGD & P. Howarth	Recent arrival
O. rupestre	Sronework	Paddington	2004 F.J. Rumsey & R.C. Porley	Recent arrival
O. stramineum	Epiphyte	Scratchwood	2009 JGD	Recent arrival
Oxyrrhynchium speciosum	Tree by water	Springwell Lock	2007 JGD	1906 record from v.-c. 21
Phascum cuspidatum var. *schreberianum*	Bare soil	Gillespie Park, Islington	2008 JGD & P. Howarth	Previously overlooked
Platygyrium repens	Epiphyte	Stanmore Common	2008 JGD	Recent arrival
Pleuridium subulatum	Bare soil	Pymme's Brook, Southgate	2009 JGD	Dubious old record for v.-c. 21
Pohlia wahlenbergii	Gravel path	Hampstead Heath	2006 JGD	1923 record from v.-c. 21
Racomitrium aciculare	Gritstone boulders	Mile End Park	2009 JGD and S. Pressel	Introduction about 2000 on boulders used for landscaping
Rhynchostegium megapolitanum	Bare ground	Gunnersbury	2005 J. O'Reilly	1905 record from v.-c. 21
Syntrichia papillosa	Epiphyte	Mutton Brook	2006 JGD	Recent arrival
S. virescens	Old tarmac	Orthopaedic Hospital grounds, Stanmore	2008 JGD	Recent arrival?
Weissia brachycarpa var. *brachycarpa*	Bare soil	Highgate Cemetery West	2008 P. Howarth & JGD	Previously overlooked, absence of suitable habitats
W. longifolia var. *longifolia*	Bare soil	Highgate Cemetery West	2008 JGD & P. Howarth	Previously overlooked, absence of suitable habitats
Zygodon conoideus	Epiphyte	Hampstead Heath	2004 JGD	Recent arrival
Z. rupestris	Damp stonework	Highgate Cemetery West	2005 JGD	Recent arrival

Canals and rivers

Unlike all other bryophyte habitats in London, those around the rivers, waterways and canals have probably witnessed fewer changes from the nineteenth century to the present. To date, there are only three NVCRs from these locations in the twenty-first century (*Cinclidotus fontinaloides, Gyroweisa tenuis, Oxyrrhynchium speciosum*), and these simply reconfirmed old records (Table 2). Most species recorded over 100 years ago, including *Didymodon nicholsonii, Fissidens crassipes, Hygrohypnum luridum, Leskea polycarpa* and *Scleropodium cespitans,* with the exception of *Dialytrichia mucronata* (first recorded in 1981 and still present in 2009), almost certainly persisted throughout the twentieth century but have gradually increased in abundance and spread around the canal system into East London as water quality gradually improved over the last 20–30 years. A specimen of *D. nicholsonii* collected from the Thames at Laleham in 1906 by E.B. Bishop is most remarkable in that it pre-dates the original description of this species based on Nicholson's specimens from Amberley Wild Brooks in Sussex (Culmann, 1907). Species either not seen for many years or lacking vouchers are almost certainly waiting to be refound (e.g. *Hygroamblystegium humile, H. varium* and *Rhynchostegiella litorea*).

The most notable change in the waterside mosses has been the spread of *Fissidens fontanus,* first recorded from the Thames at Shepperton by Paul Richards and David Catcheside in 1927 and then by Ted Wallace in 1994 in the Grand Union Canal near Harefield (Fig. 3a). It has now extended around the canal systems encircling the north of London and is particularly luxuriant where the Mile End Road crosses the Regent's Canal in the East End.

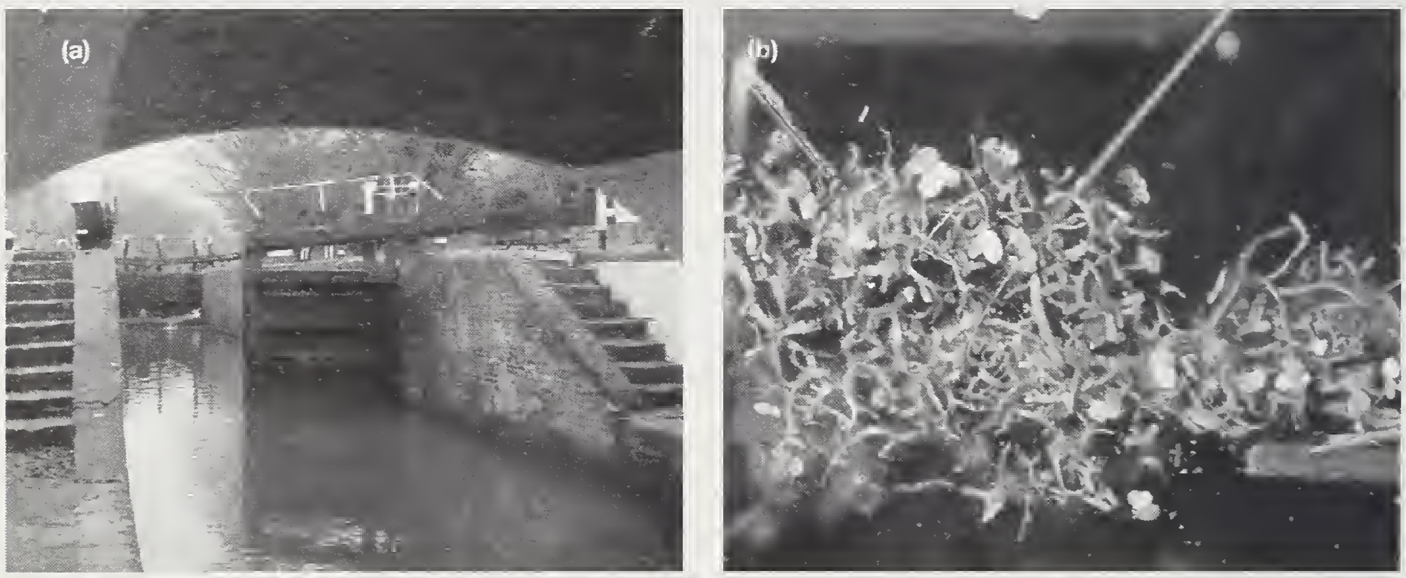

FIGURE 3. Canals and rivers. (a) Springwell Lock on the Grand Union Canal. *Fissidens fontanus* is abundant below the water, whilst immediately above it is a continous zone of *F. crassipes.* The damp brickwork of the steps supports *Gyroweisia tenuis* and *Tortula marginata.* (b) *Riccia fluitans* in a pond on the Sandy Heath, Hampstead.

Photos: J.G. Duckett

As to species of open water, *Riccia fluitans* (Fig. 3b) is perhaps the most capricious of all London's bryophytes, having been variously found sometimes in great abundance and then disappearing completely from several ponds and lakes. In recent years it has been seen regularly only in ponds on the Sandy Heath, Hampstead, whereas in 1950 it was abundant in the Viaduct Pond on the East Heath. *Ricciocarpos natans* has been seen but once in the canal at West Drayton in 1943.

In the Polytrichales, stomatal presence (*Polytrichastrum, Polytrichum*) or absence (*Pogonatum*) is one of the key characters used for generic diagnoses (Smith, 2004). We therefore cultivated *F. fontanus in vitro* to explore whether or not there are any protonematal characters, in addition to the absence of stomata and a central strand in the stems, that might lead to the resurrection of the genus *Octodiceros.* Whereas *Fissidens adianthoides, F. bryoides, F. cristatus, F. incurvus, F. rufulus* and *F. taxifolius* all produce highly branched, bluntly pointed, non-gemmiferous chloronemata [see Newton et al. (2000) for an illustration] both in nature and in culture, the counterpart in *F. fontanus* is sparsely branched with rounded apices. These studies also led us to a surprising discovery about its rhizoid system in the wild.

Whenever and wherever we collected *F. fontanus* from the Regent's and Grand Union Canals, we found the rhizoids to be heavily infected with parasitic, rostellopsid (chytrid) fungi (Fig. 2f, g), only previously recorded sporadically from a handful of other mosses (Martinez-Abaigar et al., 2005). Examination of numerous herbarium specimens of *F. fontanus* from other localities, not only in Britain (the Oxford canal, the Severn in Shropshire and the River Dee in Chester) but also as far afield as rivers in Lesotho, and the Nile in Egypt, revealed the invariable presence of this fungus. Widening our investigation, we found no trace of the fungus in collections of *Fissidens crassipes, F. rufulus, F. adianthoides* and *F. monguillonii,* except for its sporadic occurrence in *Platyhypnidium riparioides* but never in *Leptodictyum riparium* growing with it. The galls in *F. fontanus* also bear an uncanny resemblance to the brown spherical gemmae described from a population of *Dialytrichia mucronata* from the Golan Heights in Israel (Hernstadt and Heyn, 2004). The illustration of one of these at the tip of a long, unbranched rhizoid indicates that they are almost certainly rostellopsid galls. These are absent from our British collections of *D. mucronata* and those of *Cinclidotus fontinaloides,* except for one from along Bow Brook, a tributary of the Avon at Peopleton in Worcestershire. In 2005, Howard Matcham also found similar infections in a *D. mucronata* collection from a stone gutter at Westbourne Church, near Havant, South Hampshire. The occurrence of rostellopsids in *D. mucronata, F. fontanus* and *Platyhypnidium* invites further studies as these may provide a most sinister explanation for the widely reported decimation of amphibians in Britain and worldwide by chytridiomycosis (Beard and O'Neill, 2005). On the one hand, molecular studies may demonstrate whether the moss-rhizoid parasite and the amphibian killer are one and the same fungus; on the other, experimental studies are needed to see if the rhizoid fungus leads to disease in amphibians.

Bogs and heathland

These are the habitats that have suffered most from habitat destruction, and many species lost from localities in the London area are probably permanent extinctions. Though experience dictates that speculation about what might occur in the future is often proved wrong, it would appear unlikely that the following liverworts will reappear; *Blasia pusilla* (Hounslow Heath, nineteenth century), *Odontoschisma sphagni* (Hampstead Heath, 1832), *Ptilidium ciliare* (Stanmore Common, 1925) and *Trichocolea tomentella* (Queen's Wood, Highgate, 1700). For the following bryophytes, however, it would seem only a matter of time before they turn up again: *Nardia scalaris* (Harrow Weald, 1982, but without voucher), *Bartramia pomiformis* and *Brachythecium glareosum* (Springwell, 1950 and 1951), *Calliergon giganteum* (Stanmore Marsh, 1922), *Campylophyllum calcareum* and *Campylium stellatum* (both Harefield, 1896), *C. protensum* (Ruislip and Stanmore Commons, 1920s), *Climacium dendroides* (Swakeleys Park, 1893), *Hylocomium splendens* (Ruislip, 1927), *Oxyrrhynchium schleicheri* (Springwell, 1951, but without voucher), *Pogonatum nanum* and *P. urnigerum* (Harrow Weald, 1922 and 1907, respectively), *Rhodobryum roseum* (Hampstead Heath, 1832), *Rhytidiadelphus loreus* (Ruislip, 1895), *R. triquetrus* (Harefield, 1894), *Straminergon stramineum* (Harefield area, 1922) and *Taxiphyllum wissgrillii* (Springwell, 1955, but without voucher).

On the positive side, six species of *Sphagnum* continue to flourish in two sites on Hampstead Heath, just as they did when described by Christine Rieser (1998), although whether all these got there by natural means is clouded by the wilful introduction into the bog west of Kenwood, by one of the gardening staff, of unidentified species from the New Forest to boost the Hampstead population. Growing with the sphagna in this bog, Ken Adams, in 1993, found London's then only known population of *Pellia neesiana*. The fact that these plants were all female, and still are today, led Ken to suggest that they might have arisen from a single spore (Kent, 2000). The presence of female plants alone has also added to nagging doubts about the status of this *P. neesiana* population. Was it inadvertently introduced from the New Forest along with the sphagna? The discovery of a second large population of *P. neesiana*, but this time male, by Peter Howarth and JGD in 2008 in the swamp around inflow to the Stock Pond some 400m from the Kenwood bog indicates that *P. neesiana* is almost certainly native. The other London *Sphagnum* populations in the north west around Harefield, Harrow Weald, Ruislip and Stanmore (Richards, 1928) have become much depleted since the 1920s, and over the years Middlesex has lost *S. capillifolium* subsp. *rubellum*, *S. subnitens* var. *subnitens*, *S. compactum* and *S. inundatum*, although new recent records of *S. fallax* and *S. palustre* from Loxley Green Local Nature Reserve (the Borough of Barnet's only bog) are welcome additions. The two best-known southern hemisphere introductions into Britain — *Campylopus introflexus*, first recorded in Sussex in 1941, in Surrey in 1952 and in Middlesex at Mill Hill in 1962, and *Orthodontium lineare*, first recorded in Yorkshire in 1920, in Surrey on Farnham Common in 1940 and in Middlesex on Harrow Weald Common in 1951 — both spread rapidly throughout London both north and south of the Thames to occupy virtually all suitable habitats by the early 1960s.

Terrestrial habitats; bare soil

Perhaps the most striking change in the terrestrial flora of London has been the spread of *Hennediella macrophylla* (Fig. 4a) since the first record by, who else other than Harold Whitehouse, along the River Crane in 1968. Since then it has been found not only in riverine locations, but also on hard-packed soil on paths and in flower beds and shrubberies in parks throughout London both north and south of the Thames, exactly the same habitats as in its type locality in the Botanic Gardens of the University of Canterbury, Christchurch, New Zealand. Stevenson and Hill (2008) suggest that the patchy distribution of *H. macrophylla* in King's Lynn probably reflects the fact that this likely introduction from the southern hemisphere (Hill et al. 1991) is still spreading in Britain. In London it now occupies all suitable niches. Perhaps one of the more surprising additions to London's bryophytes was the discovery of *Sphaerocarpos michelii* growing on broken ground by a car park below Pryors Field on Hampstead Heath. Since then it has been found by pteridologist John Edgington (Edgington, 2003) along a path on an otherwise totally unremarkable area of amenity grass by Shadwell Station in the East End, and by Peter Howarth in Gillespie Park Nature Reserve (Fig. 4b) within a stone's throw of King's Cross.

The absence of typical arable field taxa from the Middlesex list, noted by Ken Adams in Kent (2000) as likely to occur, simply reflects a rare and declining habitat with more and more pastures given over to horses. The fact that our first visit to an arable field near Harefield (in 2007) resulted in records for the usual suspects *Riccia glauca* and *R. sorocarpa*, and that a recent survey of Waterfall Walk, Southgate, turned up *Ephemerum minutissimum* and *Pleuridium subulatum*, indicates that further forays will add other taxa not seen for many years, e.g. *Acaulon muticum* (New Years Green, 1926), *Microbryum davallianum* (Ruislip Common, 1925) and *Tortula lanceolata* (Ruislip, 1965, but without

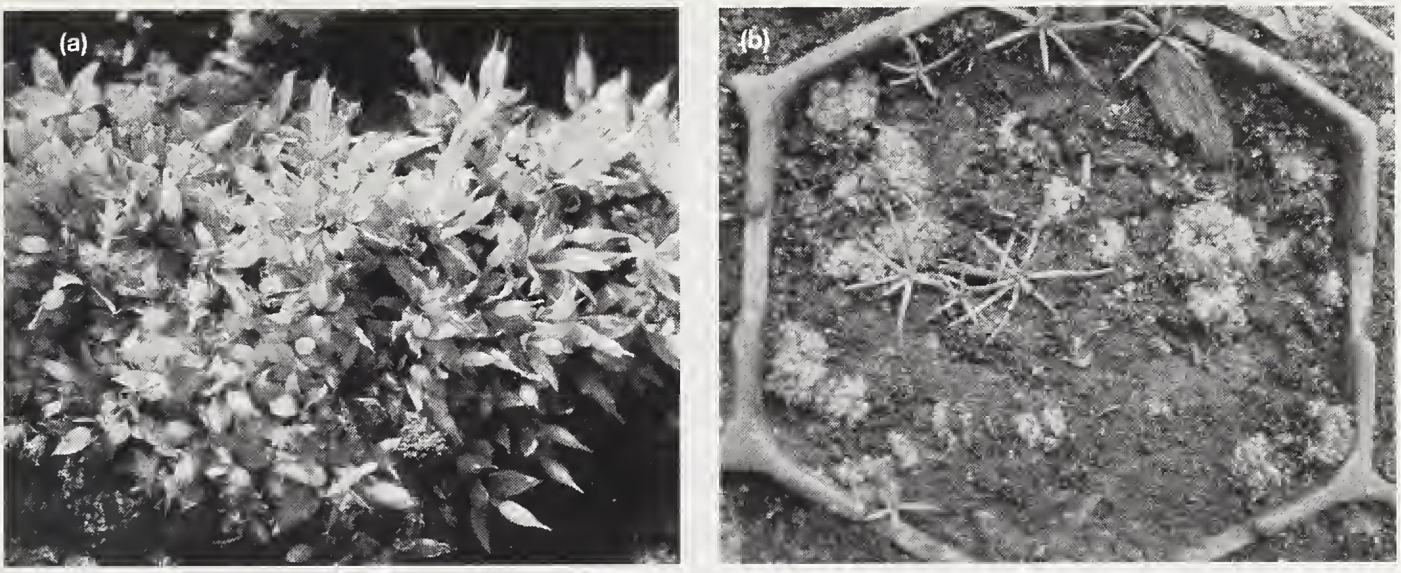

FIGURE 4. Terrestrial habitats; bare soil. (a) *Hennediella macrophylla*, Hampstead Heath Extension. (b) *Sphaerocarpos michelii*, Gillespie Park Local Nature Reserve, near King's Cross. *Photos: J. G. Duckett*

voucher). The paucity of arable fields notwithstanding, ephemeral Pottiaceae are perplexingly under-represented in London. Paradoxically, some less common arable taxa have turned up in urban sites near to Central London; in 2008, *Weissia brachycarpa* var. *brachycarpa* and *W. longifolia* var. *longifolia* were found in quantity on a newly cleared bank in Highgate Cemetery West and *Phascum cuspidatum* var. *schreberianum* in the Gillespie Park Nature Reserve near King's Cross. *In vitro* cultivation of this taxon alongside var. *piliferum* and type *P. cuspidatum* indicates that all three are clearly distinct and thus their status probably requires re-evaluation.

The discovery of *Riccia cavernosa* at Ruislip Lido in 1993, and several bare mud localities for *Aphanoregma patens* suggests that this habitat could well produce other taxa new to London. Apart from the very restricted occurrence of the *Riccia* spp., the only other complex thalloid liverwort that is common in London is *Lunularia cruciata*. *Marchantia polymorpha* (always var. *ruderalis*), recorded after WWII as abundant on bombed sites (Kent, 2000) is now known from but a handful of 'natural sites' in parks and on a dripping wall in Stepney Green Underground station, other than its sporadic appearance in greenhouses and garden centres.

Epiphytes

The data summarized in Table 2 demonstrate incontrovertibly that epiphytic bryophytes have increased dramatically in the London area since the 1980s. Apart from *Lejeunea cavifolia* and *Homalia trichomanoides* that are very likely to be refound, the only other long-term and almost certainly permanent extinctions are probably *Frullania tamarisci* (Hampstead Heath, 1830), *Antitrichia curtipendula* (Enfield Chase, 1741) and *Pterygonium gracile* (on beech, Enfield Chase, 1762). In addition to the species listed in Table 2 whose distributions have undergone marked changes can be added persistent species. These are *Cephalozia bicuspidata, Lepidozia reptans, Lophocolea heterophylla, Metzgeria furcata, Amblystegium serpens, Aulacomnium androgynum, Brachytheciastrum rutabulum, B. velutinum, Bryum capillare, Dicranoweisia cirrata, Homalothecium sericeum, Hypnum cupressiforme, Isothecium myosuroides, Rhynchostegium confertum* and *Tetraphis pellucida*. The influx of new species seems to have had little effect on the abundance of these pollution-resistant stayers with the exception of *Tetraphis* and *Orthodontium*. Back in the dirty days of the 1960s, these were the only mosses commonly found at the bases of oaks; today they have been replaced by *Hypnum andoi* and *Isothecium myosuroides*, with *Tetraphis* and *Orthodontium* now mainly confined to birch trunks and dead wood, the latter often with large areas of gemmiferous protonemata (Duckett et al., 2001). As to the last habitat, the distribution of *Dicranum flagellare* has largely remained unchanged and is limited by the availability of old hornbeam coppice stools, whilst *D. montanum* has spread onto the trunks of living trees. *D. tauricum* is now frequent on a variety of both dead and living trees in woodlands throughout the London area (Fig. 6c). The recent discovery of *Nowellia curvifolia* on a decorticated log on Stanmore Common is matched by Ken Adams finding it recently in Epping Forest. Similarly, it was only a matter of time before *Lophocolea semiteres* was discovered on Hampstead Heath in 2009 given its abundance in Epping Forest to the east and in Surrey to the south-west of London.

JGD still remembers Jack Gardiner's delight when, in 1983, *Frullania dilatata* was found for the first time in the twentieth century in Middlesex in Ruislip Woods (Gardiner and Bowlt, 1983). Today, it is common in sheltered wooded areas throughout the London area (Fig. 5a), as are *Orthotrichum lyellii* (Fig. 6b), *Ulota bruchii, U. crispa* and *Cryphaea heteromalla*, the last species almost always with numerous sporophytes and often forming patches over 10cm in diameter. *Ulota phyllantha* is also frequent at three sites (Hampstead Heath, Bentley Priory and Moat Mount) on sloping turkey oak, ash and willow trunks (Fig. 5a). There are fewer records from south of the river, but sightings of all five species in the last four years on Barnes Common, and in Dulwich Park and Crystal Palace Park, indicate centripetal spreading since Jack Gardiner's 1981 Surrey flora, like that seen in Middlesex. In fact, Jack in 1981 noted a decrease in *Cryphaea* since Ted Wallace described it as occurring all along the (North) Downs in 1941 (Wallace, 1941); in 1981 it had very few extant localities and those were all restricted to the far south of Surrey. Since it was first recorded as an epiphyte on Hampstead Heath in the 1990s *Grimmia pulvinata* has become widespread on a variety of trees in the London area. *Radula complanata*, found for the first time on Hampstead Heath by Alan Harrington in 2005, is also increasing, but not quite as dramatically as *Metzgeria consanguinea* and *M. violacea*. It is now common at Stanmore, Loxley Green, Scratchwood and on Hampstead Heath to see these two species, together with another rapidly spreading new arrival, *Zygodon conoideus*, completely clothing sallow branches and trunks (Fig. 6a). Such a vast increase in abundance is probably the consequence of a series of wet summers, as is the unusual sight of *M. violacea* growing as an epiphyll on ivy on Hampstead Heath (Duckett, 2008b).

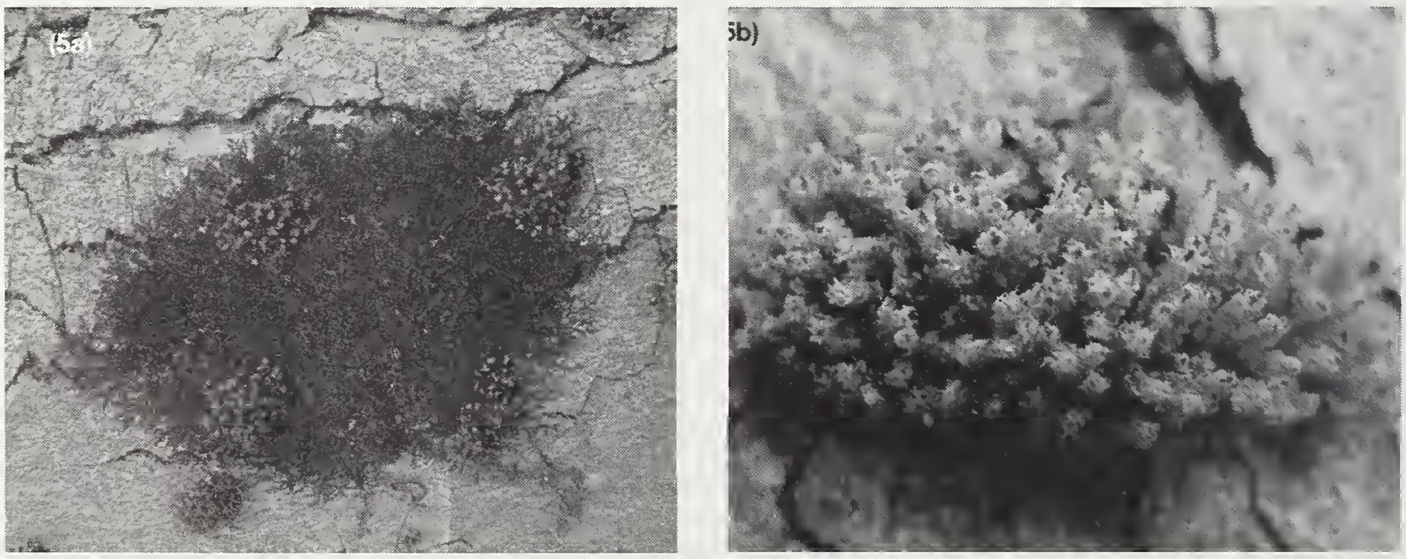

FIGURE 5. Epiphytes. (a) Sloping ash trunk at Moat Mount with a fine colony of *Frullania dilatata* and tufts of *Ulota bruchii, U. crispa* and *U. phyllantha* (b).

Photos: J. G. Duckett

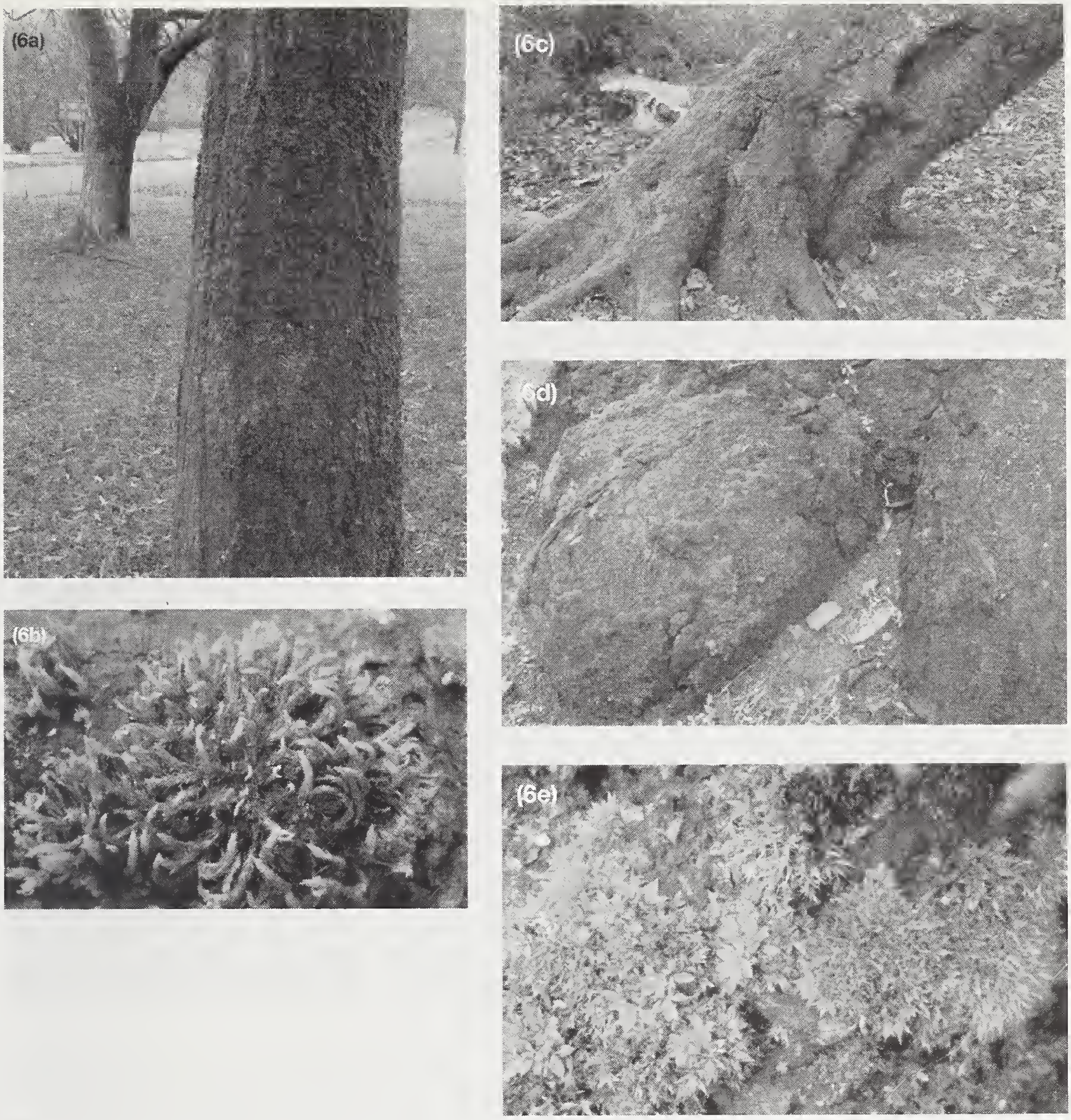

FIGURE 6. Epiphytes. (a) Sallows in the grounds of Stanmore Orthopaedic Hospital with trunks covered with *Zygodon conoideus* and patches of *Radula complanata.* (b) Highly tomentose colony of *Orthotrichum lyellii* at Scratchwood. (c) Sloping birch, Sandy Heath, Hampstead covered with *Dicranum tauricum, D. montanum, Dicranoweisia cirrata, Hypnum andoi, Lophocolea heterophylla* and *L. semiteres.* (d) Moss-covered bole at the base of a *Prunus* in Hugo Road, Tufnell Park. (e) A close-up view showing *Syntrichia papillosa* growing with *Orthotrichum diaphanum* and *Grimmia pulvinata,* now a common epiphyte on a variety of trees in London. *Photos: J. G. Duckett*

An interesting feature of the two *Metzgeria* species is that, unlike the exogenous gemmae in most leafy liverworts (Duckett and Ligrone, 1995), these are endogenous in origin (Ligrone and Duckett, 1993). This is a novel morphological feature that supports the most recent total-evidence liverwort phylogenies that closely link *Metzgeria* with the Aneuraceae (Forrest et al. 2006; Crandall-Stotler et al. 2008). The pale colour of the thalli of *Riccardia incurvata,* illustrated here for comparison with *Metzgeria* (Fig. 7a–d), is due to most of the upper surface of mature thalli being made up of the empty cell walls remaining after gemma liberation. The multicellular foliar gemmae in *Radula* are also endogenous in origin but, considering the near-crown group position of the Radulaceae, this is almost certainly a derived feature in the Jungermanniidae. In gemmiferous *Radula,* portions of the leaf margins are also caducous.

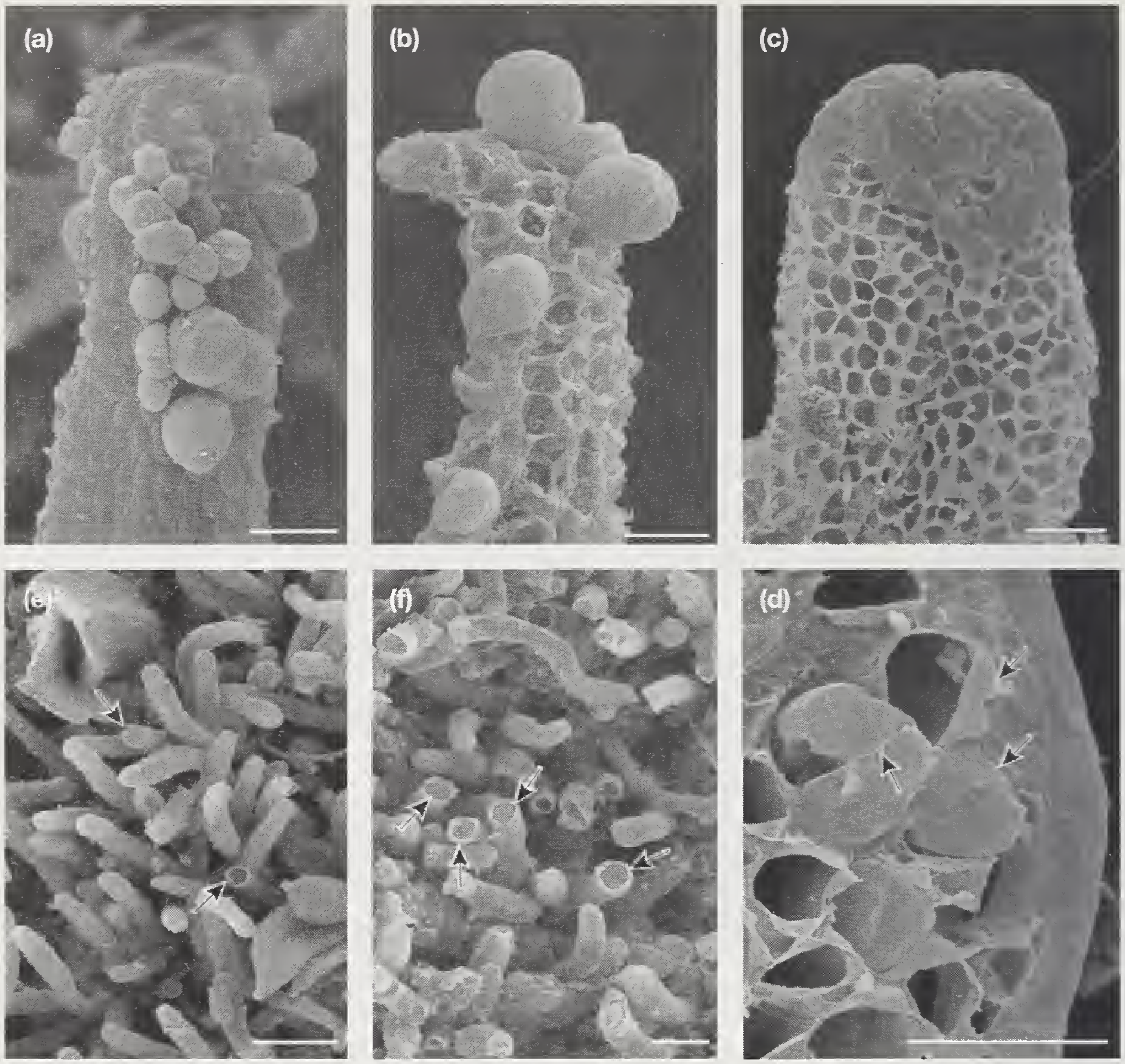

FIGURE 7. Scanning electron micrographs [see Duckett & Ligrone (1995) for preparative methods]. (a–d) Formation of endogenous gemmae in *Metzgeria violacea* (a, b) and *Riccardia incurvata* (c, d), an important character linking the Metzgeriaceae and the Aneuraceae. Note the pits remaining in the thalli after gemma liberation. In (d) the original outer walls of the thallus are peeling off (arrowed) exposing the gemmae below. (e, f) Gemmiferous protonemata of *Orthotrichum affine* (e) and *O. diaphanum* (f). Broken walls of the abscission cells of liberated gemmae are arrowed. Bars, 50 μm.

Photos: J. G. Duckett

On the theme of asexual reproduction *Zygodon conoideus, Orthotrichum affine* (see Goode et al., 1993 for a full description) and *O. diaphanum* can all be found in London as extensive patches, often up to 10cm in diameter, comprising gemmiferous protonemata bearing only scattered rudimentary gametophores (Fig. 7e, f). Those of the latter species are readily distinguished by their dark red coloration. In contrast, in *O. lyellii*, the *Orthotrichum* producing the most copious foliar gemmae, gemmiferous protonema is hard to find even in highly tomentose colonies (Fig. 6b), and these are absent in the other orthotricha.

Considering the recent increase in *Syntrichia papillosa* across southern England, it was only a matter of time before it turned up in London. Following the first record (Mutton Brook alongside the North Circular Road), it has now been found by Peter Howarth along the Woodland Walk, a disused railway line running from Highgate to Finsbury Park, on Stanmore Common, and forming large tufts alongside *S. laevipila* on the swollen root boles of grafted *Prunus* in

Hugo Road, Tufnell Park (Fig. 6d, e). As in rural Surrey (Gardiner, 1981), *S. laevipila* var. *laevipiliformis* appears to be scarce in London.

Though most new arrivals have been increasingly found in other localities, e.g. *Cololejeunea minutissima, Microlejeunea ulicina, Orthotrichum pulchellum* and *Ulota phyllantha, Orthotrichum striatum* remains restricted to Hampstead Heath. For the future it will be interesting to see whether the same will also prove to be the case for *Platygyrium repens*, recently found (2008) on a sloping ash trunk on Stanmore Common. *P. repens* was first found in Surrey, east of Chiddingford, well outside London by Brian O'Shea and JGD in 1969 on an excursion led by Ted Wallace. This was one of the very few occasions when Ted became distinctly ruffled that someone else had got an NVCR in his beloved county! Since the original record, *P. repens* has turned up in only three other Surrey localities, all well outside London.

Perhaps the clearest sign yet that London trees now are a good place for epiphytes was our discovery in 2009 of *Frullania dilatata, Orthotrichum lyellii, Ulota crispa* and *Zygodon viridissimus* on sloping ash trunks in Mile End Cemetery within the sound of Bow Bells and deep in Jack the Ripper and Kray Twins territory, once considered the grimmest part of the capital on every count.

Acknowledgements

We dedicate this article to Ted Wallace and Jack Gardiner with happy memories of many days of field bryology in the 1960s and 70s together with Brian O'Shea, Monica Milne-Smith and Joyce Smith, not to mention Wendy Gardiner's macaroni cheese suppers washed down with much whisky in Jack's house at Lancaster Gate following the excursions! We thank Ken Adams, Alan Harrington and Peter Howarth for making available their records of London bryophytes, Howard Matcham for drawing on his remarkable knowledge of moss biology, Mary Clare Sheahan for her critical reading of the manuscript and Karen Renzaglia and the staff at the Imaging Center, Southern Illinois University for electron microscope facilities. Silvia Pressel acknowledges the financial support of a Leverhulme Trust Early Career Fellowship. Without the kind permission of Mrs Jean Pateman and the Friends of Highgate Cemetery that allowed Peter Howarth and JGD to explore the West Cemetery, the five NVCRs from there would have remained undetected.

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Botany report for 2008 and 2009

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Abstract

This report details interesting or significant plant records from within the LNHS recording area polygon for 2008 and 2009.

Introduction

In late 2008 the LNHS Botany Committee and I decided that the time had come to start planning for an update of Rodney Burton's *Flora of the London Area* (1983). Since the publication of that work, the plant life of Greater London and the surrounding region has changed massively, the abundance of many non-native plants has increased, whereas many of our rarer native species continue declining or have become extinct; thus, the publication of a new flora seems necessary. Since 2008 there has been a series of planning meetings that have investigated a wide range of issues such as the geographic scope of the project, the taxonomic coverage and methods of recording. As you can imagine these discussions have generated a diversity of opinions and some matters remain to be resolved. I do not feel it is necessary to go into the detailed aspects of the project in this article, but if you would like to learn more or are not on the e-mail circulation please do contact me (lnhs_plant_recorder@hotmail.co.uk). Also, we are hoping to have a series of pages on the LNHS website in the future that will provide information on the project and its progress; I would welcome assistance in setting these pages up.

In the spring of 2010 Clive Stace published the third edition of his *New flora of the British Isles* (Stace 2010*a*). Following significant advances in molecular biology Clive has made some major changes to the arrangement of the flora and in particular the circumscription of several major plant families. For a useful summary of why he has made these changes I would recommend his recent article in *Watsonia* (Stace 2010*b*). This report follows the arrangement within the second edition of the *New flora of the British Isles* (Stace 1997) but subsequent reports (and the London Flora Project) will follow the third edition.

Although I make efforts to verify all information reported it is inevitable that some errors will occur; in particular, please notify me if you are aware of identification, grid reference or location detail errors.

FLOWERING PLANTS – arranged alphabetically by family

Acanthaceae

Acanthus mollis **bear's-paw** was recorded by Clive Schofield from the Regent's Canal towpath just east of Colebrook Row, Islington (vc. 21: TQ317833) in 2006 and previous years. This persistent plant was still there in 2008; it is likely to be planted or an escape; as yet I have never seen seedlings of this plant in this country.

Agavaceae

Cordyline australis **cabbage-palm** has been known to produce seedlings for quite some time in SW England and other milder parts of the British Isles. Several recent examples of seedlings in the London Area have been documented. Ian Kitching recorded it from the following sites during 2008: Cottenham Park Recreation Ground, Merton (vc. 17: TQ227697) and Burdett Road near Bow Common Lane, Mile End (vc. 21: TQ365821). A single large plant was found on the LNHS Surrey Docks trip lead by Nick Bertrand on 18 August 2008 at Barnes Terrace (vc. 16: TQ367781). On 2 May 2008 I recorded several seedlings growing in the top of a Victorian wall on Shepperton Street, Islington (vc. 21: TQ324839).

Alismataceae

In my 2007 report I commented that *Baldellia ranunculoides* **lesser water-plantain** had reappeared at Glebelands LNR, Barnet (vc. 21: TQ269910), its only known Middlesex site. On 12 July 2008 Robin Blades visited the site on behalf of Rodney Burton's Rare Plant Register and found three plants, so its situation would seem precarious. The latest edition of Clive Stace's *New flora of the British Isles* (2010) now recognizes two subspecies. Subspecies *ranunculoides* appears to be the more widespread and probably occupies most of the British range whereas subspecies *repens* appears to be restricted to the western parts of Great Britain (and thus seems to have a similar distribution to *Luronium natans* **floating water-plantain**. It is probable that the Glebelands plants are ssp. *ranunculoides* but confirmation would be desirable (as would further monitoring and suitable site management guidance for the landowners).

Sagittaria latifolia **duck-potato** is locally naturalized in various parts of Surrey and may be increasing; Ian Kitching found it at Beddington Park (vc. 17: TQ287651) on 22 August 2009. This species is likely to be confused with the native *Sagittaria sagittifolia* **arrowhead**; in ponds in the London area it is probably wise to check carefully floral characters to see which species is present as duck-potato is often planted ornamentally.

Amaranthaceae

The genus *Amaranthus* is, for many botanists a challenge, myself included. Overall, relatively few people in the London area attempt to record individual species and there is probably a great temptation to record all findings as *A. retroflexus* **common amaranth**. Since 2000, the following species have also been reported in our part of south-east England and should be considered: *A. albus* **white pigweed**, *A. blitoides* **prostrate pigweed**, *A. blitum* **Guernsey pigweed**, *A. bouchonii* **indehiscent amaranth**, *A. caudatus* **love-lies-bleeding**, *A. cruentus* **purple amaranth**, *A. deflexus* **perennial amaranth**, *A. hybridus* **green amaranth**, *A, hypochondriacus* **prince's-feather**, *A. powellii* **Powell's amaranth**, *A. viridis* **slender amaranth** and *A.* × *ozanonii*. Of these, only *A. bouchonii*, *A. cruentus*, *A. hybridus* and *A. retroflexus* have been reported since 2006. With the exception of *A. retroflexus*, most of these are apparently of rather fleeting occurrence. It would be interesting to know if *A. albus* still occurs around the former Ford car plant at Dagenham, as reported in Burton (1983). I suspect it is long gone from Bignells Corner, Potters Bar. Ideally, if you record one of the rarer species of *Amaranthus* a voucher specimen would be valuable (please contact me if you would like guidance on how to prepare specimens).

Apiaceae

Most of us tend to omit recording subspecies of widespread plants; this is unfortunate, as there can be significant differences in their abundance or ecology. A good example of this is *Aethusa cynapium* **fool's parsley**. The widespread native subspecies *cynapium* is a common plant of gardens, brownfields and arable land; there are also two non-native subspecies: ssp. *agrestis*, a scarce but probably under-recorded archeophyte of arable land and ssp. *elata* (syn. *cynapioides*), a rare casual. Records submitted that omit subspecific determinations are of value but their utility would be much enhanced by attempting to identify the plant to subspecies level; in this case, possible rates of decline for ssp. *agrestis* or information on the occurrence and potential establishment of the currently very rare ssp. *elata*. Rodney Burton recorded ssp. *agrestis* from a track running alongside a wheat crop east of Priory Lane, Eynsford (vc. 16: TQ5466) on 2 July 2008.

Over 120 plants of *Bupleurum tenuissimum* were found by Margot Godfrey on saltmarsh by the River Darent flood barrage (vc. 16: TTQ539777) on 22 September 2009. This is the first recent confirmed non-casual site in the Greater London area.

Hydrocotyle ranunculoides **floating pennywort** continues its inexorable spread and was reported from the River Wandle in Mitcham (vc.17: TQ181720) by E.J. Taylor, P. Wakeham and E. Walters in the *Newsletter* of the Surrey Botanical Society (No. 14, April 2009). In the same publication, a small patch of *Hydrocotyle vulgaris* **marsh pennywort** was reported by Peter Wakeham from One Island Pond on Mitcham Common (vc.17: TQ293674). I understand the Environment Agency is attempting to remove this invasive species from the Wandle. It was also found in the Ravensbourne at Deptford Creek (vc. 16: TQ3777) by Nick Bertrand on 24 July 2008 who acted promptly to remove the plant. Nick believes it may have 'rafted' into the creek from elsewhere, such as the Wandle or Lee, as he has not found it further upstream on the Ravensbourne.

Oenanthe aquatica **fine-leaved water-dropwort** was recorded from Shortwood Pond, Staines (vc. 21: TQ048718) by Aaron Woods on 2 August 2009. On the same day, Aaron recorded *O. fistulosa* **tubular water-dropwort** from Butts Ponds, Staines Moor (vc. 21: TQ030736) and *O. fluviatilis* **river water-dropwort** from the River Colne, Staines Moor (vc. 21: TQ031730).

Aristolochiaceae

Howard Matthews visited Harrow Weald Common on 7 June 2008 and confirmed the continued existence of *Arisarum proboscideum* **mousetail plant** as a large patch to the east of the hotel (vc. 21: TQ142928).

Asteraceae

Achillea ptarmica **sneezewort** is now a very scarce plant in Middlesex; Robin Blades recorded its continued survival at Totteridge Fields (TQ224942) on 2 June 2008. Records of this plant frequently turn out to be the cultivar 'The Pearl', a plant that may persist for many years in semi-natural grassland.

A popular garden plant, particularly for hanging baskets, *Bidens ferulifolia* **fern-leaved beggarticks** has been recorded several times as an escape in the London area recently. I suspect it may become more widespread. Mick Crawley found a plant in Langley (Buckinghamshire, vc. 24: TQ022791) on 8 December 2008.

An LNHS Surrey Docks trip lead by Nick Bertrand on 18 August 2008 recorded a single plant of *Crepis biennis* **rough hawk's-beard** in a filled-in dock at Stave Hill Ecology Park, Rotherhithe (vc. 17: TQ361794).

Clive Schofield recorded *Echinops bannaticus* **blue globe-thistle** by the towpath of the Regent's Canal in Shoreditch (vc. 21: TQ327837) on 15 June 2008, where he had found it in previous years; he thinks it is likely that it was planted.

Gnaphalium luteoalbum **Jersey cudweed** was once a very rare plant in Great Britain; of late it seems to be increasing in frequency in the London Area. Nick Bertrand reported it twice during 2008 from Marsh Wall, Canary Wharf, Tower Hamlets (vc. 21: TQ371800), where there were several hundred plants, and a single plant from outside the Creekside Centre, Deptford, Lewisham (vc. 16: TQ375772). The latter record probably originated from a population that Nick found in Hither Green the previous year. At both Hither Green and Marsh Wall Nick found *Saxifraga tridactylites* **rue-leaved saxifrage** growing with the cudweed. Not far from the Marsh Wall site Ian Kitching found three plants at St Katherine's Dock, Wapping, Tower Hamlets (vc. 21: TQ341805) on 23 June 2009; later that year, on 17 September, he found a single plant on Kew Road, Richmond-upon-Thames (vc. 17: TQ189771). During the LNHS botany meeting in September of 2009 *G. luteoalbum* was found at the Barnes Wetland Centre. It is likely that many of these plants are arriving via container-grown plants from the Continent.

The apomictic genus *Hieracium* (hawkweeds) has long been known to be challenging and the recent revision of the group by P.D. Sell in Sell and Murrell (2006) has increased the number of accepted species from 261 to 412! Inevitably, this means that some earlier records in the London Area should be re-evaluated where possible. There is one notable exception, *H. umbellatum* is a relatively distinctive plant and is generally recorded accurately (notwithstanding the comments that Rodney Burton made in the *Flora of the London Area*, 1983: 161–162). Contemporary records should be backed up by a good quality specimen; having said that, many of the surviving populations of hawkweeds in the London Area are small and declining and any collecting should be cautious, please contact me if you would like further information regarding the collecting of these plants. A recent significant record for one of these plants originated from Islington where two plants of *H. nemophilum* **grassland hawkweed** were found by me growing on a brick wall adjacent to the Regent's Canal (vc. 21: TQ329838) in 2008. This plant is largely native to limestone areas of north-west England and Wales with a few isolated records from elsewhere in England as a non-native. Ian Kitching recorded six plants of *H. spilophaeum* **spotted hawkweed** (syn. *H. maculatum*) from the North Downs Way, Oxted (vc. 17: TQ378543) on 16 June 2009; this non-native species of uncertain origin is apparently widespread in southern England.

Away from the chalk soils in the southern parts of the LNHS recording area polygon *Inula conyzae* **ploughman's spikenard** is a scarce plant. It has long been known from the Woolwich Arsenal and Tripcock Ness area but recent housing developments had much reduced the extent of suitable habitat and I was rather concerned that it may have succumbed. Happily, on 21 June 2009 the LNHS botany group found many plants growing in several sections of the Thames Path east of Tripcock Ness (vc. 16: TQ459810).

Boraginaceae

Anchusa arvensis **bugloss** and *Echium vulgare* **viper's bugloss**, were recorded by Ian Kitching in 2008 on Cantrell Road near Tower Hamlets Cemetery Park, Tower Hamlets (vc. 21: TQ3782). He also recorded numerous other plants characteristic of calcareous soils or arable habitats from the same area including: *Agrimonia eupatoria* **agrimony**, *Agrostemma githago* **corncockle**, *Campanula glomerata* ssp. *glomerata* **clustered bellflower**, *Centaurea cyanus* **cornflower**, *Glebionis* (*Chrysanthemum*) *segetum* **corn marigold**, *Clinopodium vulgare* **common calamint**, *Filipendula vulgaris* **dropwort**, *Helianthemum nummularium* **common rock-rose**, *Ononis spinosa* **spiny restharrow**, *Origanum vulgare* **marjoram**, *Papaver argemone* **prickly poppy**, *Silene vulgaris* ssp. *vulgaris* **bladder campion**, *Trisetum flavescens* **yellow oat-grass**, and *Viola arvensis* **field pansy.** All of the above were undoubtedly sown and add to the extensive list of native and non-native species known from this site. For many, such planting is anathema; whilst I must confess to mixed feelings on the issue; what I do believe, it is important that all such introductions are recorded and the source identified.

Myosotis laxa **tufted forget-me-not** was found in the company of *Baldellia* at Glebelands LNR, Barnet (vc. 21: TQ269910) on 12 July 2008 when Robin Blades visited the site on behalf of Rodney Burton's Rare Plant Register.

Brassicaceae

On the LNHS botany meeting on 21 June 2008 *Bunias orientalis* **warty-cabbage** was recorded from the Ham Lands (vc. 17: TQ1671). Mick Crawley also recorded this plant from the M4 motorway just east of Datchet (Bucks, vc. 24: TQ003775) on 6 December 2008.

Margot Godfrey found *Rapistrum rugosum* **bastard cabbage** on 16 and 25 August 2009 by the River Darent flood barrage (vc. 16: TTQ539777). A plant identified as *Rapistrum rugosum* subsp. *linnaeaceum* was recorded by Ian Kitching from Guildford Golf Course (vc. 17: TQ025499) on 18 July 2009; this subspecies is the one found in this country and there do not appear to be recent records of subspecies *rugosum* in the London Area.

Campanulaceae

Three small plants of *Trachelium caeruleum* **throatwort** were found by me on a Victorian wall in Britton Street, on the junction of Eagle Court, Clerkenwell (vc. 21: TQ317819) in early January 2009. These were then shown to the LNHS botany group on 1 February 2009. Later in the year, the wall was torn down and the plants destroyed.

Caryophyllaceae

Recent records of *Agrostemma githago* **corncockle** are almost inevitably derived from 'wildflower' seed mixes and their origins are frequently given away by the presence of *Anthemis austriaca* **Austrian chamomile**, *Glebionis* (*Chrysanthemum*) *segetum* **corn marigold** and *Centaurea cyanus* **cornflower**. This is a good example of the usefulness of recording complete species assemblages. The presence of these plants and the usual absence of other arable weed species such as *Anagallis arvensis* **scarlet pimpernel**, *Viola arvensis* **field pansy**, *Viola tricolor* **wild pansy** and *Aphanes arvensis* **parsley-piert** will often resolve any question about the introduced status of the population, particularly in urban or suburban settings.

Geoffrey Kitchener found *Cerastium diffusum* **sea mouse-ear** on 10 May 2008 on a roadside verge near the B262 roundabout south of the A2 just north of Southfleet (vc. 16: TQ6272). This species, like other native coastal plants, is moving inland along trunk roads that have been salted; however, due to its diminutive size, it is probably under-recorded and any *Cerastium* growing inland near *Cochlearia danica* **Danish scurvy-grass** should be checked carefully to see if it is this species.

The UK BAP priority species *Dianthus armeria* Deptford pink was reported by Rodney Burton from the south-western edge of Farningham Wood (vc. 16: TQ5367 and TQ5467) 'in good quantity' on 26 July 2008. Another *Dianthus*, this time the non-native *D. carthusianorum* **Carthusian pink** was recorded by John Edgington from Gallions Reach, Becton (vc. 16: TQ443806). This site is on the north side of the Thames and would be included in South Essex (vc. 18) were it not for the Norman Conquest.

Honckenya peploides **sea sandwort** was found by John Edgington growing in ballast on the edge of a railway embankment on York Way, King's Cross (vc. 21: TQ299841) on 15 February 2008. This would appear to be the first Middlesex record for this normally coastal plant.

Lychnis coronaria **rose campion** was recorded on two occasions; Clive Schofield found it on waste ground at Hampton Court Palace (vc. 17: TQ154684) on 29 July 2008 and Mick Crawley recorded it from East Bedfont (vc. 17: TQ086729) on 30 December of that year.

Sagina maritima **sea pearlwort** was recorded from several locations on the Isle of Dogs, (vc. 21: TQ37) by both John Edgington and John Swindells during 2009. In the same year, it was also reported to be widespread by John Edgington and Juliet Cairns from various locations by the Thames east of the Greenwich peninsula and Deptford Creek (vc. 16: TQ37).

Clusiaceae

Hypericum humifusum **trailing St John's-wort** is a scarce plant in Middlesex with relatively few recent records. On the LNHS botany trip to Cockfosters on 12 April 2008 good quantities were seen on a shortly mown south-facing bank at Camlet Hill, Trent Park (vc. 21: TQ289976). It was also seen on Harrow Weald Common (vc. 21: TQ1392) by John Dobson on 13 August 2009. *Hypericum hircinum* ssp. *majus* **stinking tutsan** seems to be occurring with greater frequency away from its 'core' area in the London Area — the Thames waterfront in Richmond-upon-Thames. Aaron Woods recorded it from the West Heath, Hampstead Heath (vc. 21: TQ2686) on 4 July 2009 and it was seen by the LNHS botany trip at St Katharine's Dock, Tower Hill (vc. 21: TQ3380) on 23 June of that year.

Convolvulaceae

Calystegia silvatica var. *quinquepartita*, the split-petalled form of *C. silvatica* **large bindweed** is rarely recorded and is not mapped by the BSBI on their website. Clive Schofield has recorded this plant several years running from Charlton Street, Camden (vc. 21: TQ294833), the most recent time being 28 June 2008.

Cyperaceae

Rodney Burton recorded *Carex pallescens* **pale sedge** from Farningham Wood (vc. 16: TQ541679). This plant is decidedly scarce in the London Area and appears to be dependant upon suitable habitat management (i.e. coppicing) to ensure its continued survival, although it will regenerate from a seed bank. Robin Blades recorded *Carex pseudocyperus* **cyperus sedge** on the same visit to Glebelands LNR, Barnet (vc. 21: TQ269910) that yielded *Baldellia ranunculoides* **lesser water-plantain**. Ann Rix recorded over twenty plants of *Carex strigosa* **thin-spiked wood-sedge** from Old Park Wood, Harefield (vc. 21: TQ048913) in 2008; this is the second confirmed site in Middlesex for this plant, the other being Queen's Wood, Haringey where a single plant survives all sorts of tribulations.

Dipsacaceae

Cephalaria gigantea **giant scabious** was found as an escape or garden throw-out by Clive Schofield on the Grand Union Canal at Alperton (vc. 21: TQ169841). Ann Rix found *Dipsacus pilosus* **small teasel** to be 'abundant along a damp pathway and scattered elsewhere' at Harefield Place (vc. 21: TQ0587) whilst carrying out survey work for Rodney Burton's Rare Plant Register.

Euphorbiaceae

Euphorbia characias **Mediterranean spurge** is increasingly found as a self-sown escape from gardens; Geoffrey Kitchener found such a plant in a pavement crack on the Outer Circle, Regent's Park (vc. 21: TQ2883) on 19 July 2008. *E. maculata* **spotted spurge** has been known from the Thames Path near Tower Bridge Wharf (vc. 21: TQ340802) since at least 2004; John Edgington and Brian Wurzell saw it there on 27 September 2008 in the company of *Spergularia rubra* and *Catapodium rigidum*. It has been seen there since by others and appears to be thriving. *E. oblongata* **Balkan spurge** seems to be increasing on brownfield sites in the London Area; recent records include: Camley Street Natural Park, King's Cross (vc. 21: TQ299834) by myself annually since 2004; on a path by the railway, Raynes Park (vc. 17: TQ236695) and Thurloe Square, South Kensington (vc. 21: TQ269789), both recorded by Ian Kitching in 2008. The now rather scarce archaeophyte *E. platyphyllos* **broad-leaved spurge** was recorded from Park Road Cemetery, Isleworth (vc. 21: TQ165765) and a disused garden centre site in Syon Park in 2008 by John Latham. Finally, *Euphorbia* × *pseudovirgata* **twiggy spurge** was recorded from the base of Stave Hill, Southwark (vc. 21: TQ361798) during the LNHS Surrey Docks trip lead by Nick Bertrand on 18 August 2008. This plant is a member of the *E. esula* aggregate and is by far the commonest; nevertheless, some of the others may occur.

Fabaceae

Although still locally abundant on the chalk in the south of the area *Anthyllis vulneraria* **kidney-vetch** is a scarce plant and usually casual further north, Clive Schofield found a plant on a brownfield site at East India Dock Basin, Tower Hamlets (vc. 21: TQ392808) on 25 June 2008. Like *Aethusa cynapium*, there are non-native and native subspecies of this plant present in the London Area. Determination of this plant, if still present, to subspecies rank would be most interesting.

Lathyrus aphaca **yellow vetchling** was recorded from several areas in 2008. Peter Wakeham recorded in from Therapia Lane Rough, Beddington (vc. 21: TQ301669) on 19 June and at Croydon Airport (vc. 17: TQ312632) on 9 April. Geoffrey Kitchener found it just south of the A2 near Peppers Hill, Southfleet (vc. 16: TQ622720) on 10 May. It was seen on the LNHS botany trip to the Ham Lands (vc. 17: TQ164719) on 21 June and shortly afterwards by Clive Schofield. Juliet Cairns found eleven thriving patches on Woolwich Common (vc. 16: TQ4277), and finally Robin Blades, on behalf of Rodney Burton's Rare Plant Register, recorded it at Rammey Marsh, Enfield (vc. 21: TQ374997) on 15 June. At both Rammey Marsh and Ham Lands *Lathyrus nissolia* **grass vetchling** was also found. During 2009, Ian Kitching found it near Bidder's Pond, Mitcham Common (vc. 21: TQ297677) on 23 May; five days later, Margot Godfrey relocated it at Collage Farm, Bexley (vc. 16: TQ486728) confirming D. Nicolle's 1998 record.

Margot Godfrey reported *Medicago sativa* ssp. *falcata* **sickle medick** from two Bexley locations in 2009. The first was by Crayford Station (vc. 16: TQ515744) where she found five or six plants, the second was a single plant from 'short dry grass by a path through field' near the Norman era moat at Howbury Farm, Crayford Marsh, Slade Green (vc. 16: TQ527767). Geoffrey Kitchener found *Melilotus indicus* **small melilot** on York Way, Camden (vc. 21: TQ3083) on 4 June 2009; this may have made its way there in the large quantity of aggregates that are coming into the King's Cross area as part of the massive redevelopment there.

The LNHS Surrey Docks trip lead by Nick Bertrand on 18 August 2008 recorded abundant *Trifolium arvense* **hare's-foot clover** in a disused tennis court site (vc. 17: TQ355794). Juliet Cairns found a small but thriving colony of *Trifolium tomentosum* on Blackheath, north of Mounts Pond Road (vc. 16: TQ387763) on 4 May 2009.

Vicia sepium **bush vetch** seems to be genuinely infrequent in much of Middlesex these days, probably due to habitat loss and deterioration; Robin Blades recorded it from Whitewebbs Wood, Enfield (TQ3299) on 15 August 2009, further records of this plant would be welcomed. On 10 May 2008 *Vicia bithynica* **Bithynian pea** was recorded by Geoffrey Kitchener from a grassy roadside bank on the south side of the A2 near Springhead (vc. 16: TQ615726).

Fumariaceae

Corydalis cheilanthifolia **fern-leaved corydalis** was recorded by Nick Bertrand on two occasions in 2008: Park Vista, near Greenwich Park (vc. 21:

TQ388778) where he has known of it for several years and near the Jewel Tower, Palace of Westminster (vc. 21: TQ302794). I also found it the same year growing on the front garden wall of a terraced house on St Asaph's Road, Nunhead (vc. 21: TQ355757). A small but thriving colony of the non-native *Fumaria capreolata* ssp. *capreolata* **white ramping-fumitory** was reported to me by John Swindells in April 2009 from the Regent's Canal towpath between Mare Street and Victoria Park, just south of Vicar's Close in Tower Hamlets (vc. 21: TQ353835). This plant is very similar to the native *Fumaria capreolata* ssp. *babingtonii* that is not present in the London Area.

Hippocastanaceae

Seedlings of *Aesculus carnea* **red horse-chestnut** are rarely reported yet they are usually distinct enough to be told apart from the much commoner *Aesculus hippocastanum* **horse-chestnut**; Aaron Woods reported a seedling from Harrington Square, Camden (vc. 21: TQ292832) in May 2008. Seedlings of *Aesculus indica* **Indian horse-chestnut** appear to be becoming much more frequent, probably due to their increased popularity as parkland trees; they rarely persist as they are often weeded out. In 2009, I saw seedlings in Kensington Gardens and Spa Green, Islington (vc. 21: TQ268799 and TQ314827), the latter plants were recorded by Aaron Woods on 30 August 2009. John Edgington recorded seedlings by London Zoo car park, Outer Circle, Regent's Park (vc. 21: TQ283836) on 8 May 2008.

Juncaceae

Juncus ambiguus **frog rush** is probably under recorded due to its similarity to *J. bufonius* **toad rush**. Ken Adams, the BSBI vice-county recorder for North and South Essex (vcs. 18 and 19), found it to be 'abundant over wide area of very wet saline marsh' on 6 September 2008 at Aveley Marsh (vc. 18: TQ5379 and TQ5479).

Lamiaceae

Clinopodium ascendens **common calamint** is now a scarce plant in much of Greater London north of the Thames. As part of survey work for Rodney Burton's Rare Plant Register, Ann Rix visited Coppermill Down, Hillingdon and recorded it there (see comments under *Anacamptis pyramidalis*: Orchidaceae) and Ian Kitching recorded it from Tower Hamlets Cemetery Park (see comments under *Anchusa arvensis*: Boraginaceae). I found a single plant growing out of brickwork on the steps of an early Victorian house in Cloudesley Square, Islington (vc. 21: TQ313837) on 8 May 2009.

Liliaceae s.l.

On the LNHS botany meeting on 21 June 2008 *Allium scorodoprasum* **sand leek** was refound at its site on the Ham Lands (vc. 17: TQ1671) and a rough count of over a hundred plants was made. This plant is native in northern parts of the British Isles but is generally considered to be non-native in more southerly areas (Preston, Pearman and Dines 2002). The non-native *Allium subhirsutum* **hairy garlic** was found by Ian Kitching in the southern portion of Mile End Park, Tower Hamlets (vc. 21: TQ363818) beside the Regent's Canal just north of the Ben Johnson Road bridge. *Allium triquetrum* **three-cornered leek** is rapidly becoming almost ubiquitous in central London with numerous records; as yet, it still seems to be more localized in suburban and rural areas. To those who are not familiar with it some care should be taken not to mix it up with the much more infrequent *A. paradoxum* **few-flowered garlic** which is usually recognizable by the presence of small bulbils in the axes of the flowerhead. In the right season (late spring and early summer) *A. paradoxum* can readily be viewed at St Anne's Church, Kew Green.

Malvaceae

David Bevan reported that *Lavatera arborea* **tree mallow** has reappeared and is clearly regenerating on the Parkland Walk near Blythewood Road (vc. 21: TQ304877), where it has been known since 2004; the plant was still present in 2008. During the LNHS botany trip to Cockfosters on 12 April 2008 a single plant was found growing in a hedge south-east of Rough Lot, Trent Park (vc. 21: TQ286975). This plant was quite a distance from housing and how it got there is a mystery. John Edgington found another (planted) singleton on 21 February 2009 by the canal towpath at Limehouse Cut, Bromley-by-Bow (vc. 21:TQ377818).

Onagraceae

Ludwigia grandiflora (syn. *L. peploides*) was found by Ian Kitching in a pond on Church Road, Old Malden, Kingston-upon-Thames (vc. 17: TQ216665) on 26 September 2009. In the same year Juliet Cairn also found it at Kidbrooke Green Nature Reserve (vc. 16: TQ4175). This is a distinctive and invasive species that should be reported immediately whenever found to the relevant vice-county recorder and the Environment Agency. In the same genus *L.* × *kentiana*, a hybrid derived from the endangered native *L. palustris* and the non-native *L. repens* was recorded as 'overrunning' Seven Post Pond, Wimbledon Common (vc. 17:TQ2373) by Ian Kitching on 11 July 2009.

Orchidaceae

Aceras (*Orchis*) *anthrophophorum* **man orchid** is a struggling species in this country and at many sites it is in decline; currently, it is listed as endangered (Cheffings and Farrell 2005, revised 2006) and is a UK Biodiversity Action Plan priority species. In 2008, four records were received, all from Surrey as part of their Rare Plant Survey. Peter Wakeham reported it from Farthing Down, Coulsdon (TQ3057) on 13 June; J. McLauchlin and M. Jennings recorded at least eleven plants from Happy Valley and Kenley Common (TQ3057 and TQ3358) on 30 June; Ian Kitching recorded two flowering plants from Howell Hill Nature Reserve, East Ewell (TQ2361).

As part of survey work for Rodney Burton's Rare Plant Register, Ann Rix visited Coppermill Down, Hillingdon (vc. 21: TQ0490), the only surviving piece of semi-natural chalk grassland in Middlesex. Coppermill Down is part of the Mid-Colne Valley SSSI. Unfortunately the last assessment of this part of the SSSI in 2009 by Natural England noted that its status was 'Unfavourable Declining' and noted that the main cause was undergrazing. It is also a Metropolitan Site of Importance for Nature Conservation. Ann recorded *Anacamptis pyramidalis* **pyramidal orchid**, *Briza media* **quaking-grass**, *Clinopodium ascendens* **common calamint** and *Linum catharticum* **fairy flax**, all scarce species in the London Area north of the Thames due to the lack of calcareous soil. In addition to the above species, the SSSI and SINC citations also refer to the presence of *Primula veris* **cowslip**, *Bromopsis erectus* **upright brome**, *Ononis repens* **common restharrow**, *Trisetum flavescens* **yellow oat-grass**, *Leontodon hispidus*, *Sanguisorba minor* ssp. *minor* **salad burnet**, *Cirsium acaule* **dwarf thistle** and *Ophrys apifera* **bee orchid**.

Two records of *Cephalanthera damasonium* **white helleborine** were reported in 2008, both from Surrey as part of their Rare Plant Survey work. J. McLauchlin and M. Jennings recorded it from Whitgift Field, Riddlesdown (TQ339603) on 26 June, and Ian Kitching recorded one fruiting spike from Howell Hill Nature Reserve, East Ewell (TQ239619).

Nick Bertrand found a thriving colony of *Ophrys apifera* **bee orchid** on a brownfield site near Canada Water in Rotherhithe (vc.17: TQ355796). This was reported in the *Newsletter* of the Surrey Botanical Society (No. 14, April 2009).

The most exciting plant find in Greater London since the discovery of *Apium repens* **creeping marshwort** on Walthamstow Marsh was the discovery by John Latham of a single robust plant of *Himantoglossum hircinum* **lizard orchid** in west London. Ordinarily I am a firm believer in the disclosure of site information for rare plants; however, in the case I am making an exception. This plant is particularly exciting as it is the first time in 300 years or more of botanical recording that it has been discovered in the area we now refer to as Greater London. It is also a species whose fortunes, in this country, are known to be very closely linked to climatic variation (Summerhayes 1951), as such any changes in its distribution are of great interest.

Orobanchaceae

Orobanche elatior **knapweed broomrape** was recorded twice in 2008, on 26 July, J. McLauchlin and M. Jennings recorded two plants on *Centaurea scabiosa* **greater knapweed** at Roundshaw Downs, Croydon (vc. 17: TQ312629), and Ian Kitching recorded it from Howell Hill Nature Reserve, East Ewell (vc. 17: TQ238620). Ian also located a single plant at Roundshaw (TQ311626) on 13 June 2009. *Orobanche hederae* **ivy broomrape** seems to be spreading in the London Area of late. Several hundred flower spikes were found by Ian Kitching and Peter Wakeham on 30 August 2008 on the west side of Brighton Road near Bonchurch Close (vc. 17: TQ2563). This is apparently the same locality where Steve Gale found the plant in 2004. Several other colonies are to be found nearby at Cavendish Road, Cambridge Street (TQ262634) and Devonshire Avenue Nature Reserve (TQ262632). Rodney Burton found a single plant at Eynsford (vc. 16: TQ5366) on 22 July 2009.

A very surprising occurrence was the discovery of *Lathraea squamaria* **toothwort** from Railway Fields, Haringey (vc. 21: TQ317881) reported to David Bevan in April 2009. This is a long way from the nearest known native sites in the Harefield area and according to David is likely to be an introduction with hazel whips planted in 1996. The non-native *Lathraea clandestina* **purple toothwort** was found at Cannizaro Park, Merton (vc. 17: TQ2270) by Peter Wakeham in 2009. The same year D. Skinner found it under willow adjacent to the shore of the large pond in Waterhouse Plantation, Bushy Park (vc. 21: TQ148695). It was also recorded from Queen Mary's Gardens, Regent's Park (vc. 21: TQ282824) on 22 February 2009. At all of these sites this species has long been known but does not show much inclination to spread further afield, possibly due to a lack of suitable growing conditions.

Passifloraceae

Passiflora caerulea **blue passionflower** is increasingly turning up as a bird-sown escape from gardens. Ian Kitching found it at Morden Sports Ground, Morden Park (vc. 17: TQ251681) in 2008. I found a small cluster of records in the southern part of Islington (Bowling Green Lane, Lloyd Baker Square and Farringdon Road) during 2009, probably dispersed by birds from a very large and freely fruiting plant outside the Finsbury Health Centre (vc. 21: TQ312823). Later in 2009 I found a very large plant growing a long way from housing on the Southern Outfall Sewer (also known as The Ridgeway), Plumstead (vc. 16: TQ456792).

Poaceae

Several dead plants of *Anisantha diandra* **great brome** were found by the LNHS Surrey Docks trip lead by Nick Bertrand on 18 August 2008 on the Thames river wall at the northern end of Deptford Wharf (vc. 16: TQ367789). I suspect that this species is frequently overlooked and recorded as the ubiquitous *A. sterilis* **barren brome**. Apparently, it is on the increase in south-east England; I have known of its presence for several years at Camley Street

Natural Park, King's Cross (vc. 21: TQ299834) where it can be seen in the scrubby woodland at the northern end of the site. The much scarcer *Anisantha madritensis* **compact brome** was found by Ian Kitching in 2008 on Cantrell Road near Tower Hamlets Cemetery Park, Tower Hamlets (vc. 21: TQ370821).

A single plant of *Polypogon monspeliensis* **annual beard-grass** was found in a flowerbed on the Ainsty Estate, Rotherhithe (vc. 17: TQ357796) on the LNHS Surrey Docks trip lead by Nick Bertrand on 18 August 2008.

Puccinellia distans **reflexed saltmarsh-grass** is yet another coastal/halophytic species that is moving inland along trunk roads. It was recorded on two occasions, by Aaron Woods on the A30 by Shortwood Common (vc. 21: TQ046719) on 2 August 2009 and by Ian Kitching on Goods Way, King's Cross (vc. 21: TQ3083) on 25 May 2009. Ian's record is not far from where I found it at Camley Street Natural Park several years earlier, where it persisted for two or three years. So far, *Puccinellia maritima* **common saltmarsh-grass** shows no such inclination to move away from coastal areas; Margot Godfrey found this plant on 3 October 2009 by the River Darent flood barrage (vc. 16: TTQ539777), in the same area where she found *Bupleurum tenuissimum* earlier in the year.

Nassella (*Stipa*) *tenuissima* **Argentine needle-grass** is a popular plant of gardens and municipal plantings. It now occurs rather frequently as an escape but is certainly under-recorded. It was seen on three LNHS botany trips during 2008 and 2009: first at St Katherine's Dock Tower Hamlets (vc. 21: TQ341801 and TQ341801) growing through paving cracks; then from Cumberland Gardens, Clerkenwell (vc. 21: TQ310828) and finally from Waterloo (vc. 17: TQ3179). In addition, Aaron Woods recorded it from Georgiana Street, Camden (vc. 21: TQ291839) on 30 August 2009.

Polygonaceae

The apparently very rare *Fallopia* × *conollyana* **railway knotweed** was found by Nick Bertrand on the river wall of Deptford Creek in 2008. Nick took me to see the plant, which was hanging on precariously and was clearly regularly inundated at high tide. I sent a piece to John Bailey of Leicester University who confirmed the determination. Sadly, since then the original plant has been swept away by the tide although some fragments were rescued and are now in cultivation.

Aaron Woods recorded *Persicaria minor* and *P. mitis* from Butts Ponds, Staines Moor (vc. 21: TQ030736) on 2 August 2009.

An LNHS trip to Ham Riverlands recorded *Rumex pulcher* **fiddle dock** as being locally frequent in mown grassland (vc. 17: TQ167729). *Rumex* × *ogulinensis*, the hybrid between fiddle dock and *R. obtusifolius* **broad-leaved dock** was recorded from gravelly grassland in the company of both parent species by Geoffrey Kitchener at Green Street Green (vc. 16: TQ584708) on 24 July 2008. *Rumex obtusifolius* ssp. *transiens* was recorded from the Regent's Canal between York Way and Caledonian Road, King's Cross (vc. 21: TQ3083) by Geoffrey Kitchener on 18 June 2009. In the same area, at Camley Street Natural Park (vc. 21: TQ299834) Geoffrey found *Rumex* × *duftii* (*obtusifolius* × *sanguineus*) on 25 August 2009.

Potamogetonaceae

The lake at the Barbican Centre, City of London (vc. 21: TQ323817) produced several interesting aquatic plants in 2009, most notably *Zannichellia palustris* **horned pondweed**, *Potamogeton pusillus* **lesser pondweed**, *Ceratophyllum demersum* **rigid hornwort** and an as yet unidentified species of *Chara* **hornwort**. Although none of these species is rare it is certainly uncommon to find a waterbody in central London with a submerged aquatic plant community of this composition. *Potamogeton pusillus* **lesser pondweed** was also found in great abundance along with more as yet unidentified *Chara* at Tobacco Dock, Wapping (vc. 21: TQ348805) during the LNHS botany walk lead by John Swindells on 23 June 2009.

Aaron Woods recorded what looked very much like *Potamogeton nodosus* **Loddon pondweed** from Staines Reservoirs Aqueduct, just east of the bridge on the path from Church Lammas Lakes towards Staines Moor (vc. 21: TQ030736) on 4 August 2009. Unfortunately, Aaron was unable to get a close inspection of the plant and a photograph had to suffice. If this record can be confirmed it will be a first for Middlesex and a significant range expansion for this very highly localized species.

Ranunculaceae

Anemone ranunculoides **yellow anemone**, *A. blanda* **Balkan anemone** and *A. apennina* **blue anemone** were recorded by the LNHS botany group on 12 April 2008 from the informal ornamental gardens just north of Icehouse Wood, Trent Park (vc. 21: TQ292976). Although obviously originally planted all three were regenerating alongside a wide range of other naturalized ornamentals, such as *Lysichiton americanum* **American skunk-cabbage**, *Matteuccia struthiopteris* **ostrich fern**, *Erythronium dens-canis* **dog's-tooth violet** and *Fritillaria meleagris* **snake's-head fritillary** favoured in woodland gardens. The status of the native *A. nemorosa* **wood anemone** at the same site was debatable but the presence of pink and blue variants pointed to a least some plants of horticultural origin.

Seedlings of *Helleborus argutifolius* **Corsican hellebore** were reported, in the *Newsletter* of the Surrey Botanical Society (No. 14, April 2009), from a pavement near Ham Common (vc. 17: TQ181720) by Paul Bartlett.

Ranunculus peltatus **pond water-crowfoot** was reported by Peter Wakeham from One Island Pond on Mitcham Common (vc. 17: TQ293674) in the *Newsletter* of the Surrey Botanical Society (No. 14, April 2009).

Rosaceae

Acaena novae-zealandae **pirri-pirri-bur** was found by Mick Crawley on Iver High Street (Buckinghamshire, vc. 24: TQ032812) on 27 December 2008. In Great Britain this plant is a rather widespread although localized non-native, it seems to be strangely scarce in the Greater London area; perhaps it is too hot and dry here for it to thrive. Similarly, *Alchemilla mollis* **garden lady's mantle** is quite widely naturalized in some parts of the British Isles, yet still seems rather infrequent in these parts. David Bevan recorded it from Coldfall Woods, Haringey (vc. 21: TQ276902) in 2007. During 2008 it was found by Geoffrey Kitchener near the reservoir on Kemsing Down (vc. 16: TQ5459), and by John Latham from the site (now destroyed) of a derelict garden centre in Syon Park (vc. 21: TQ276902) along with *Euphorbia platyphyllos*.

The genus *Cotoneaster* is challenging to many and records are usually limited to '*Cotoneaster* spp.' or '*C. simonsii*'. *Cotoneater salicifolius* **willow-leaved cotoneaster** was reported from the Thames towpath at West Molesley by E.J. Taylor and P. Wakeham in the *Newsletter* of the Surrey Botanical Society (No. 13, October 2008).

Several plants of *Potentilla intermedia* **Russian cinquefoil** were found in masonry on the east end of the South Dock on the LNHS trip lead by Nick Bertrand (vc. 17: TQ366790).

An individual of × *Crataemespilus grandiflora* (a bigeneric hybrid involving *Crataegus laevigata* × *Mespilus germanica*) was recorded by Ian Kitching from the Thames Path near the Hawker Centre at Kingston-upon-Thames (vc. 17: TQ174712) on 25 April 2009. As is often the case, it was unclear whether this was planted or an escape.

Scrophulariaceae

A popular genus with horticulturists is *Nemesia*, some of which are confused with the closely related *Diascia* **twinspur**. Escapee plants of *Nemesia* are relatively common on streets near planters or hanging baskets; I am not convinced that we have got the nomenclature of these plants correct and the widespread occurrence of hybrids is probably making matters harder to untangle. Most escapees in the London Area are probably cultivars or hybrids of the perennial *N. fruticans* or *N. denticulata* and not the annual *N. strumosa*. Recent records include *N. fruticans* from a wall on Royal College Street, Camden (vc. 21: TQ293839) recorded by Aaron Woods on 23 August 2009 and *N. denticulata* recorded by John Edgington as 'abundantly naturalized on basement area walls and pavements on Orde Hall St and Dombey St' (vc. 21: TQ306819) on 21 September 2009.

Several plants of *Verbascum densiflorum* **dense-flowered mullein** were recorded on the LNHS botany trip to Plumstead on 21 June 2009. They were found on disturbed ground on the top of the Southern Outfall Sewer (vc. 16: TQ457792). *Verbascum lychnitis* **white mullein** is largely restricted to west Kent and eastern parts of Surrey in our area and has been recorded from this area since the time of Gerard's *Herball* (Burton 1983). Recent records include: the railway track between Alt Grove and Merton Hall Road (vc. 17: TQ244702 and TQ244703) seen from a train by Ian Kitching on 18 June 2009; the Rose and Crown chalkpit, Riddlesdown (vc. 17: TQ337593) recorded by J. McLauchlin on 9 July 2009; Rodney Burton also saw plants at Bickley (vc. 16: TQ431688), Eynsford (vc. 16: TQ531662) and Hockendon (vc. 16: TQ489681) during late June and July of 2009. All records were for var. *lychnitis* except for the one from Hockendon where var. *album* was recorded.

Urticaceae

Urtica dioica ssp. *galeopsifolia* **fen nettle** is an under-recorded plant with a disputed taxonomy; it has been treated as either a species, subspecies, variety or not recognized at all. It is found in distinctive habitats and I believe it is worthwhile recording, whatever its taxonomic rank. R. Hopkins found plants in 2009 agreeing with the description from Uxbridge Alderglade (Buckinghamshire, vc. 24: TQ056854) a Hertfordshire and Middlesex Wildlife Trust nature reserve. Very similar material was found further upstream near the Colne at Widows Cruise Covert, Denham Country Park (Buckinghamshire, vc. 24: TQ051873) on an LNHS botany trip the previous year. To my mind, one of the most interesting plants of recent years to turn up in London is *Urtica membranacea* **membranous nettle**. This plant was first reported in 2006 from Warwick (Boucher and Partridge 2006). Aaron Woods contacted me in March 2008 to tell me he had found a plant of it at Clarkson Row, Camden (vc. 21: TQ290832). Very shortly after confirming his determination I found a thriving colony on St John's Street, Islington (vc. 21: TQ313828). After finding the Islington plants, I mentioned their discovery to a colleague of mine at the Natural History Museum, Christopher Davis, who informed me that he had known of it from Portobello Road (vc. 21: TQ250806) for several years but had been, until that point, unaware of its significance. Later that year, on 21 November, Nick Bertrand found another healthy colony outside Gloucester Hall, Little Britain, City of London (vc. 21: TQ319814). Nick then found another location, with just one plant, at Donaldson Road, Greenwich (vc. 16: TQ439766) on 24 April 2009. I then found another large colony in Long Yard, off Lamb's Conduit Street (vc. 21: TQ306821) on 27 April. A little later that spring, on 2 May, John Edgington discovered about five plants on Molyneux Street, Marylebone (vc. 21: TQ274815). Finally, towards the end of 2009 Sheila Ayres probably found another plant on Leather Lane (vc. 21: TQ312818). This later record requires confirmation, as unfortunately, by the time I got to Leather Lane, the Council street cleaners had beaten me to it. As I discussed for other non-natives in my 2007 *London Naturalist* report I suspect this plant is being introduced via the horticulture trade. The recent cold winters seem to have had no effect upon the plants either, which is rather surprising for a wintergreen annual native of the Mediterranean region; as soon as the snow melted the plants continued growing and were flowering very shortly afterwards.

Solanaceae

Hyoscyamus niger **henbane** is rarely recorded from Middlesex and is usually a casual probably due to the lack of nutrient-rich calcareous soils in the area. Ian Kitching found one small plant by a pigpen at Mudshute Park, Millwall (vc. 21: TQ381788) in 2008.

Solanum laciniatum **kangaroo-apple** was recorded in 2008 from Brunswick Gardens, Camden (vc. 21: TQ304822) by me on 7 January; Mecklenburg Square, St Pancras (vc. 21: TQ305824) by Aaron Woods and John Edgington and others on various dates; and by Ian Kitching and myself from the west edge of Thurloe Square, Kensington & Chelsea (vc. 21: TQ269789). Early in 2009 I also found it on Lloyd Baker Square, Islington (vc. 21: TQ310827).

FERNS – arranged alphabetically by genus

John Edgington found *Adiantum raddianum,* a maidenhair fern, at two locations in central London on the same day, 18 May 2008: Hans Street, Belgravia (vc. 21: TQ278792) and Ellis Street (vc. 21: TQ280788). Typically, this plant seems to be fond of basement walls and this is where I found a large mature plant in St Peter's Street, Islington (vc. 21: TQ318835) on 26 June 2008 growing alongside a *Dryopteris* sp. and a *Cyrtomium* sp. Aaron Woods recorded it from a wall on Rossmore Road, Lisson Green (vc. 21: TQ272821). *Blechnum spicant* **hard fern** is now a very scarce plant in Middlesex. On 7 June 2008 Howard Matthews found a single plant in a boundary ditch at a known site on Harrow Weald Common (vc. 21: TQ145930).

Cyrtomium and other non-native wall-inhabiting ferns would appear to be increasing in central London recently. A single plant of *C. falcatum* **house holly-fern** recorded by the LNHS botany group from a drain on an access road to some flats on Hall Road, St John's Wood (vc. 21: TQ264828) in 2008. House holly-fern was also seen on another LNHS botany walk from St Katharine's Dock (vc. 21: TQ340806) on 23 June 2009. *C. fortunei* **Japanese holly-fern** would appear to be more frequent than *C. falcatum* in central London of late (bucking the national trend) and was recorded from the following locations: John Edgington found it in Gutter Lane, Islington (vc. 21: TQ322813) on 18 December 2008; on the freezing cold LNHS botany group meeting on 1 February 2009 several plants were seen in the basement of a house on Wharton Street, Islington (vc. 21: TQ308826); a little later in the year I found it on Lloyd Baker Street, near the junction with Amwell Street (vc. 21: TQ311828); nearby in another basement in Great Percy Street, Aaron Woods recorded it on 30 August 2009; Ian Kitching recorded it between Morden Wharf and Enderby's Wharf, North Greenwich (vc. 17: TQ391789) on 16 June 2009.

Dryopteris cycadina was recorded by John Edgington from the wall of the channel between Greenland and Surrey Docks, Greenwich (vc. 17: TQ364791) on 9 October 2010.

Ian Kitching recorded 'a very large number of senescent plants' of *Ophioglossum vulgatum* **adder's-tongue fern** from Mitcham Common near the junction of Cedars Avenue and Commonside East (vc. 17: TQ285684) on 30 May 2009.

John Edgington recorded *Pteris nipponica* **variegated ribbon-fern** from a basement in Titchborne Row, Westminster (vc. 21: TQ272811) on 12 October 2008; by 31 December it was gone. Aaron Woods recorded two plants of the same species from a low wall in Bridgeway Street, Somers Town (vc. 21: TQ295832). Aaron's determination was confirmed by Fred Rumsey. *Pteris vittata* **rusty brake** was recorded on 25 October 2009 from brickwork by the edge of the pond in front of the Palm House, Kew Gardens (vc. 17: TQ187769) by N. Anderson and verified by John Edgington .

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Book review

How to begin the study of mosses and liverworts. June Chatfield. Illustrations by Chris Doncaster, Christine Rieser, Michael Demidecki and the author. British Naturalists' Association, PO Box 5682, Corby, Northants NN17 2ZW. 2008. 60 pp., paperback, £5.50. ISBN 978 0 9502862 6 6.

Approaching the study of mosses and liverworts appears to many people a rather daunting prospect. They are such small plants, with characters that can only be distinguished with the help of a lens or even a microscope. However, they are interesting to observe throughout the year, and indeed are more visible and flourishing in the winter months when higher plants are unrewarding. They can also be very beautiful, like higher plants but in miniature. There are several books available to help in bryophyte identification, but these may also be rather daunting for the inexperienced, and June Chatfield's small book is welcome. It is intended very much for the beginner, using straightforward non-technical language, and including an explanation of the Linnean binomial system. June Chatfield points out that it is not intended as an identification manual, rather as a tool to get started with some basic information about the group.

There are chapters on the habitats where they are found, the structure and growth forms of thalloid and leafy liverworts, Sphagna and other mosses. There is information about sexual and vegetative reproduction and nomenclature, and practical advice on microscopy, collecting and preserving specimens, and the culture of mosses at home. There are many attractive and useful illustrations, both line drawings and photographs.

If I have a quibble, it is that it tends to jump from one aspect of the subject to another, which can lead to some duplication — for example there is a paragraph near the beginning on where and when to look for bryophytes which is echoed in the habitat section, and in other sections on epiphytes and buildings.

But this is a minor failing; anyone looking to take up the study of bryophytes would learn a lot and would undoubtedly be motivated to take the subject further.

Mary Clare Sheahan

Book review

A monograph on some British desmids. Alan J. Brook, and David B. Williamson. Edited by James H. Price and Nicholas J. Evans. Ray Society, London 2010. vi + 364 pp., 157 b/w plates (line drawings), 1 colour plate. £60 hardback, ISBN 0 903874 42 3.

The desmids are a family of green algae noted for their beauty of form. This ranges from simple, oblong unicells (the saccoderm desmids), to unbranched filaments, or to elaborately ornate and deeply incised unicells or filaments (the placoderm desmids). The greater number of species belongs to the placoderm desmids and these generally have a narrow waist or isthmus dividing the cell into halves ('semicells'). The improvement of microscope lenses during the nineteenth century brought desmids to the attention of the greatest botanists of the time.

Although desmids get an early mention in Dillwyn's *British Confervae* of 1809, the first major work in English was Ralfs' *The British Desmidieae* (1848), which described and figured 162 species and 32 varieties of British desmids. M.C. Cooke, in his derivative and error-strewn *British desmids: a supplement to British fresh-water algae* (1887), described 271 species and 40 varieties, with another 19 species and two varieties in a supplement.

Ralfs's work was expanded in a thorough monograph by the West brothers, published by the Ray Society from 1904 to 1923, which described 690 species and 400 varieties. The Wests' volumes brought together all the published information concerning British desmids, supplemented by the great amount of work they had done themselves. Although it remains a vital reference work of enduring merit, a great deal has happened in the classification over the intervening century and one needs to have access to a table of synonyms when reading it.

The fortunes of desmids have risen and fallen with the number of amateur naturalists. Desmids have nothing which can be exploited by man and neither are they a nuisance to him; professional scientists generally ignore them. Since the Wests' monograph, few books have been published on the family; a noteworthy exception being the 1980 title from the FBA by Lind and Brook, which remains a useful introduction and guide.

The freshwater algal flora of the British Isles (2002) referred to the book under review as 'in press', described 325 of the 770 species of desmids then recorded from the UK and said that this book would be 'first volume of a monograph on this group'. It was eagerly awaited: the authors are renowned for the extent and depth of their knowledge of desmids. Alan Brook in particular has written extensively on the biology, identification and distribution of these algae, and co-wrote the desmid section of the *Flora*.

Having waited so long for a good book on desmids, they have now come in a crowd, like buses. Peter Coesel and Koos Meesters produced a handsome illustrated guide in 2007 and last year there was an excellent, and again beautifully illustrated, introduction and identification guide from David John and David Williamson.

This present volume is a monograph which updates the previous Ray Society work. The authors stress the morphological variability of desmids and this has the practical result that it contains a great number of illustrations, particularly of the commoner species, in an attempt to prune back the proliferation of varieties. In their preface, the authors have stern words for the Wests and their 'legacy of emphasis on trivial detail'.

This work does not cover all British species: it restricts itself to the subfamily Mesotaenioideae (saccoderm desmids) and the families Peniaceae and Closteriaceae (filamentous or elongate placoderm desmids); these are two groups which actually show less morphological variation than other desmids, but contain some interesting and widespread genera.

The appearance of desmids is distinctive and it was for a long thought, or hoped, that this mirrored a similar lack of ambiguity in classification. Alas, things are seldom so simple and it has been suggested that they are closer in affinity to the stoneworts than their gross morphology could suggest. The authors here offer a sure guide through the taxonomic jungle, and propose a classification for the order Zygnematales (to which the desmids belong) based on molecular data, cytological studies and studies on the cell walls of desmids. They go as far as to ask whether the unicellular genera can legitimately be referred to as desmids at all but fortunately, and for now, allow them into this volume.

The greater part of the book is taken up with the identification keys, which are a model of clarity. They proceeds genus by genus and describe (and show) species characteristics that are constant and those which are variable. The illustrations are large and clear. About a hundred species are described, in seven saccoderm and four placoderm genera. The treatment of the genus *Penium* is very welcome; since the Wests' monograph twenty-two of the species they described in this genus have been moved elsewhere. The large genus *Closterium* naturally takes up nearly half of the keys. This genus has sixty-nine species and sixty varieties, although the authors regard a few of these as doubtful; they regard with particular suspicion any variety designated *elongatum* or *brevis* and remark: 'varieties should only be accepted as such when the character in question occurs consistently as a character possessed by a whole population'.

All species descriptions are followed by detailed notes on their ecology and distribution. As the authors have shown that some described varieties and even species are examples of polymorphism, they take care to include pH information wherever they can. So, for instance, on *Closterium subulatum*: 'A cosmopolitan species, which would appear to tolerate waters ranging from moderately acidic to alkaline (pH6.5–7), but also found associated with *Sphagnum* at pH values as low as 4.4.'

The recording of water parameters is stressed in the section on collection, observation and use of the keys. Desmids occur 'exclusively' (p. 5) or 'almost exclusively' (p. 14) in fresh water and are especially abundant in acidic waters; for example, the *Sphagnum* bog and the *Utricularia* pond of Malham Tarn FSC yield scores of species. There is a growing belief that desmids might after all be useful for something — as indicators of water quality. For those involved in such work this book will be vital because of the way it details what variations occur in which species at what pH.

Perhaps not for complete beginners (who would be better off with John and Williamson's book, *A practical guide to the desmids of the west of Ireland*), but anyone interested in algae will welcome this book for its survey of a beautiful group of organisms which are assuming importance in our attempts to take the pulse of the planet. The exposition of the taxonomy is clear and authoritative and the collecting hints practical. A comprehensive bibliography of 300 references concludes this deeply satisfying book. The production standards are up to the usual high level of the Ray Society, whose members are able to buy it for £20.

It is not yet a complete substitute for the Wests' monograph but it is to be hoped that other volumes, covering the rest of the British desmids, will not be far behind.

MARK BURGESS

Details of membership of The Ray Society may be obtained by writing to The Honorary Secretary, The Ray Society, c/o Natural History Museum, London SW7 5BD.

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Book review

Books and naturalists. David Elliston Allen. New Naturalist No. 112. Collins, London. 2010. 498 pp. Softback, £30, ISBN 978 0 00 730017 4; hardback, £50, ISBN 978 0 00 724084 5.

Writing a book is not easy. Few make their livings doing it. Yet, as David Allen states, natural history is one of the most book-dependent of pursuits. His admirable book gives an account of a selection of the major British and Irish natural history authors writing about their home countries, as distinct from books written by those settling overseas. In the earliest years covered almost every book is mentioned, but clearly this could not be kept up since the volume of natural history books started to increase sharply even so long ago as the mid eighteenth century. Publications in journal articles are almost entirely ignored: there are simply too many.

Book authors have had in common the motivation, tenacity, opportunity and finance to write a book and to see it through to publication. Many major works summarize a lifetime's effort, and many of them have been published posthumously by the efforts of others. In the early days the tasks of both authors and publishers were Herculean, being fraught with every conceivable difficulty. Even today, when an author's finance might be assured by a publisher's advance, the other demands remain. Indeed, in the New Naturalist series itself there has been a steady change from mainly amateur authors at its inception in the 1940s to a high proportion of professional authors in recent years owing, perhaps, to the huge post-war increase in essentially government-funded full-time natural-history jobs and a consequent raising of standards.

The fascination of reading Allen's long and absorbing book is to learn of these trials and tribulations of authors of all periods. His book shows wide and profound delving, great perspective, and a lot of work. Every page seems to have detailed yet seldom boring information. More important, the text has innumerable nuggets of interpretive insights and observations that make the book much more than just a succession of super-précis. The writing style is clear and unpretentious, and the book is even inspirational when one realizes that so many revered authors of justly acclaimed works led normal lives with all the problems that we all have. Both the quality and the range of illustrations Allen includes are excellent, and usefully enhance the text.

I had just a few criticisms. Scant mention is made of the many bibliographic lists of natural-history works and their illustrations that a small number of compilers have laboriously prepared and which would be the staple for anyone writing such a book as this. Citations of both facts and conclusions are given almost nowhere (save a brief reference list for each chapter given in an Appendix at the end of the book). Hence one seldom knows whether Allen's findings are his own or someone else's: but such presentation is presumably to some extent demanded by the editors of the series. Still, it is a pity that most of the hundreds of fascinating anecdotes cannot be traced to their source. Thus, we learn that one of the nineteenth century's most prolific authors, the Revd J. G. Wood (I almost cut my teeth on his *Homes without hands* and still treasure it), fell over a pile of dung while rushing for a train, damaging his writing hand. So he had, at last, to learn to use one of those new-fangled typewriters in order to write his later books. But who unearthed this fact? Most of the chapter headings are unhelpfully whimsical: 'Disguise Discarded'; 'Self-Help'; 'Contingent Damage'; 'Wider and Deeper Still'; and so on. The mere dates of the period each covers would have been more useful.

There are some notable exclusions. Some authors, maybe those who have been most widely biographed, are treated understandably briefly (Charles Darwin, for example — I wonder, incidentally, if he was a member of the Haggerstone Entomological Society, and therefore claimable by LNHS as 'one of ours'?). At least some famous geologists, even the revered Charles Lyell, are not mentioned. Nor, justifiably, are agricultural and fisheries literature. Indeed, a mere reference list of all natural-history books written within and about the British Isles would by itself fill a moderately large volume. Included, creditably, are many books on minor groups, accounts of many of the publishers of the books which we value so much, and consideration of today's growing secondary literature of semi-popular, so useful, field guides and handbooks.

Unlike some NNs of the past decade, I found no spelling mistakes. The type is clear and the margins adequate, though why the text is not right-justified eludes me. I read the paperback version, and the binding and the lie of the grain of the paper conspired to close the book automatically whenever it was open — which seemed to defeat the object of publication!

Allen's book demonstrates that there has been a transition. In the early days natural history, mainly botany, was the province of the apothecary. Slightly later, still only the wealthy had leisure time to devote to it. In the late nineteenth century it became accessible to more 'middle class' people, especially to women who were excluded from many male careers. Last, the older of us have witnessed in post-war Britain a rapid change to what we have today, with innumerable nature reserves and about a million RSPB members, for example, and natural history's becoming an integral part of our national psyche. This book provides a clear and readable account of this important process, seen through these islands' books, which in turn has contributed to a growing groundswell across much of the planet demanding, at last, a green Earth.

I hugely enjoyed this book, and I recommend it to all who wonder how today's dazzling array of wonderful and affordable natural-history books has come about.

Paul F. S. Cornelius

Book review

Bird migration. Ian Newton. New Naturalist No. 113, Collins, London. 2010. 598 pp. Softback, £25, ISBN 978 0 00 730732 6; hardback, £45, ISBN 978 0 00 730731 9.

While this might be rather simplistic, migration used in many ways to be quite straightforward; pretty much in winter ducks and geese, in summer swallows, cuckoos etc., and generally birds flew decent distances but returned to the same place and usually flew in the appropriate north/south direction. Seabirds were a bit difficult to allocate but luckily and this was the key point — migration could always be described as a mystery when any troublesome sighting seemed out of place. In fairness it was usually the ability to navigate so well that was the main issue for discussion.

There is now a considerable amount of information on bird migration. Ian Newton has outlined the current understanding of the topic without overwhelming the reader with an excess of specific flight requirements, routes etc. The starting point is to expand the different types of bird movement including routine day-to-day movements, dispersal movements, dispersive migration, migration proper, irruptions or invasions and nomadism. This allows the choices ranging from resident to partial migrant to full migrant; with the reasonable aside to wonder why more birds than the common poorwill do not hibernate.

The next topics are reviews of how migration is and has been studied, followed by migration in and around the British Isles. A point to stress here is that while this book concentrates on migration as it relates to the birds of Britain and Ireland, the obvious point is that many of our classic birds do not spend most of their year here so the scope of this book is global since the themes underlying the migration are so fully explored. Particularly interesting is the section on birds' annual cycles, in that birds do not all have the same order of breeding, moulting and migrating, but there are up to eight potential sequences.

The following chapters focus on flight, speeds and fuel, routes and the impact of weather. Having recently seen raptor migration near Gibraltar I was fascinated to read that a common buzzard will lose in gliding mode about one metre of height for every fifteen metres of forward motion. Thus if it climbed through use of thermals to 1,000 metres it could glide about fifteen kilometres without flapping its wings — the shortest distance between Spain and Africa. This is but one example in these sections that leads up to a chapter on specific amazing journeys, including the distinctly amazing bar-tailed godwits of the *baueri* race that migrate the Pacific flyway from Alaska and Siberia down to New Zealand and back.

The penultimate section concentrates on migration timing, the annual cycles, site-fidelity and dispersal and on to vagrancy, whether drift, overshooting or the proposed examples of reverse-direction migration. This all makes more sense when the separate routes used by geographically different population segments of even the same species are outlined to show they may meet in the same wintering zone. Perhaps even more thought provoking is the realization that the development of certain species seems to presuppose that in the glacial periods there were even longer ice-crossings to reach the few remnants of open tundra. Clearly there still are mysteries in migration studies.

The final chapters concentrate further on the evolution of migration, recent changes in migration, geographical patterns, sex and age differences in migration, population limitation, irruptions and declining migration numbers. All these chapters are strengthened by a discussion of migrants in Africa, bringing the global picture together even if house martins still seem to disappear off the known map each year.

This is admittedly quite a lot to take in at one read so I imagine most readers will need to browse the chapters and then bring the various strands together. Underlying the reason for migration is, after all, the logic that it is better for any particular species to move and exploit different resources through the year, but this is still a risky strategy. As ever, one theme emerges which is the need for more data and for that, even in the age of the micro-chipped warbler, the role of the amateur birder is essential and relevant indeed to the members of the LNHS.

MICHAEL WILSDON

Book reviews

Mayfly larvae (Ephemeroptera) of Britain and Ireland: keys and a review of their ecology. J. M. Elliott and U. H. Humpesch. Freshwater Biological Association. Scientific Publication No. 66. 2010. 152 pp., 246 × 171 mm, softback. ISNB 978 0 900386 78 7, ISSN 0367 1887. £27 plus p. & p. from FBA, The Ferry Landing, Far Sawry, Ambleside, Cumbria LA22 0LB. Tel. 01539 442468.

It is almost seventy years since the FBA published its first key to the Ephemeroptera and over the years the importance of this group of insects in assessing biological water quality has become increasingly important. Since the last edition, by the same authors, and published in 1988, three species have been added to the British list bringing the total to fifty-one for Britain and Ireland. Also, taxonomic advances have resulted in changes in nomenclature, hence the decision by Professors Elliott and Humpesch to update this important work.

In this new edition, the opportunity has been taken to expand the section on ecology, much of it based on the authors' own researches, and this has broadened the appeal and value to fit in with present-day needs. The Introduction covers external characters, classification, and collection and preservation. The keys to families and species are clearly illustrated, and like many groups of animals and plants, the salient key characters are indicated by 'Peterson-style' pointers. The line drawings are clear and well executed. There are seven pages of colour photographs of larvae, either freely swimming or resting on their substrate. There is a six-page tabular summary of the habitats and habits of the species and this is followed by a detailed review of the life histories and biology and then a summary of applied aspects of their ecology. The work ends with over 500 references, a species index and a list of fishermen's names.

To sum up: this is a well-produced, easy-to-follow guide to a fascinating section of aquatic entomology. Next time you see mayflies hovering delicately over a pool or river, just give a thought to how their developmental stages spend sometimes two years out of our sight in a harsh environment avoiding the predations of dippers and hungry fishes.

K. H. Hyatt

Checklist of flowering plants and ferns in the Isles of Scilly. Rosemary Parslow. Isles of Scilly Museum. 2009. A5 softback, 116 pp. plus 8 pages of colour plates showing 48 species in various habitats. ISBN 978 0 9562903 0 4. £4 at Isles of Scilly Museum on St Mary's. Obtainable also from Summerfield Books (BSBI members) and other specialist suppliers.

This checklist is based on records in the database maintained by the author as BSBI recorder for the Isles of Scilly in preparation for a new *Flora* of the islands. It is a replacement of the 1983 checklist and gives brief descriptions of the status and distribution of the species, both native and established aliens.

In recent years a number of our botantists who have been visiting the Isles of Scilly have enrolled in Rosemary Parslow's botanical excursions around the islands as well as joining Will Wagstaff's regular natural history tours.

Also, for an excellent wide-ranging introduction to the islands, and especially for those planning to visit the islands for the first time, I recommend the same author's New Naturalist volume, *The Isles of Scilly*, which we reviewed three years ago in *LN 86*.

K. H. Hyatt

Book review

The flora of Hertfordshire. Trevor James. Hertfordshire Natural History Society. 2009. 526 pp. Hardback, £49.50. ISBN 978 0 9521685 8 4.

The first plant record from Hertfordshire was spindle found by William Turner in 1548 by the side of the old road to Cambridge. This prompts Trevor James' suggestion that it has always been a county people have passed through on the way to somewhere more interesting. This is not a universal rule; many botanists will have made an Easter pilgrimage to see this book's glamorous cover star, pasque flower, at Church Hill near Royston where it can number more than 60,000. Hertfordshire now also has the distinction of having had two atlas floras following that published by Dr John Dony in 1967 on the basis of a survey which started in 1950 (reviewed *Lond. Nat.* **46**: 146–147).

Hertfordshire, of course, overlaps with the LNHS recording area, particularly as this volume adds the areas included in the administrative county in the twentieth century to the Watsonian vice-county. Although there is no gazetteer, the index of sites will allow our members to locate mentions of places such as Cheshunt gravel pits, familiar to all sections from our field meetings. However the built-up area off lurking to the south does not often make its presence obvious on the maps; the Lea Valley stands out more for familiar London species such as *Conyza sumatrensis* and *Hirschfeldia incana*.

The main survey for this work ran from 1987 to 2001 with some later records for rarer and critical species and was carried out at tetrad scale. It covered 1,969 species, 155 subspecies and 116 hybrids compared with 1,376 species and 54 hybrids in Dony. The increase has two major causes: 923 neophyte species and greater coverage of critical groups. Hawkweeds, elms and particularly brambles are dealt with thoroughly with no less than twenty-four *Rubus* species mapped. There are brief notes on dandelions but daffodils are not discussed in detail.

An issue for a second atlas flora is how to show the information from the previous publication. The choice here is to take advantage of the shape of the county to include a separate, rather small, map in the top left hand corner rather than to use different symbols or colours on a single map. The species maps do not show the detail of geology or terrain given in some recent floras but it is possible to look back to maps in the introduction. More of an irritation is that the gridlines on the species maps and those in the introduction are not numbered.

The introduction includes chapters on the methods of the current survey, the history of recording in the county, the physical and historical background, habitats, the county's changing flora and alien plants and a nine-page section of coloured habitat photographs. After the species accounts come two appendices: a red data list for the county and a list of accessible sites with grid references, parking and public transport information. The difficulties caused by factors such as evenness of coverage and change over the survey period are carefully assessed. The history of recording has the nice approach of extending to the participants in the current survey including several photographs of them in the field. The habitat chapter discusses the occurrence of those defined in the National Vegetation Classification and makes critical comments about its limitations as a system.

Trevor James summarizes the major shift as being from plants characteristic of ancient habitats maintained by centuries of stable management towards a landscape of heavily disturbed habitats and the plants associated with them. This theme runs through from comments on the origins of some of the county's most interesting landscapes in the historical chapter to predictions about future trends.

A huge amount of information is made available to help the assessment of change. The introduction includes a few pairs of photographs showing how they can illustrate change. It is suggested that the habitat photographs will gain in value over time as they show what it was that the current team was surveying, though they might perhaps have been slightly fewer and larger. Tables in the chapter on the changing flora list extinct, decreasing and increasing species and analyse them by habitat and by relative conductivity and nitrogen requirements. For those species included in both this and Dony's survey the species accounts include the percentage change and a comment on the trend though the complications caused by different coverage in the two surveys are made clear.

Altogether 83 plants are considered to have become extinct, 32 of them wetland and aquatic species. Change had already started well before the previous survey with 27 of the extinctions before 1900 but 16 since 1975. Wetland species also feature strongly among both decreasing and increasing native species, in the latter case perhaps thanks to the county's gravel industry. Calcareous grassland species seem to be declining more in the county than nationally. Woodlands are often seen as one of the more robust semi-natural habitats but problems there are also highlighted. For example, herb paris has decreased by 69 per cent to just eight tetrads.

Road-verge floras have been changed by both mismanagement and the impact of salt which explains the spread of Danish scurvygrass. This comes second to buddleia as the most increased species, but perhaps more surprisingly green alkanet is next and a few places behind is its relative, wood forget-me-not. The latter highlights another complication and there are separate maps showing all records and its restricted native distribution. An additional table in the chapter on alien plants analyses them by source of introduction and shows the proportion from each category in the 131 which have become well established. Garden escapes and aquatic plants have proved much better at this than grain contaminants and those introduced with wool shoddy.

This volume is a fine tribute to the work of all who contributed to the survey but above all to Trevor James for both the huge job of bringing it all together and the subtlety of his analysis and interpretation of the material.

Robin Blades

Book reviews index

The Carrifran Wildwood Story. Myrtle and Philip Ashmole et al. 30
An odyssey with animals. Adrian R. Morrison 36
Art of the New Naturalists. Peter Marren and Robert Gillmor 60
Where to watch birds in Kent, Surrey and Sussex. Don Taylor, Jeffery Wheatley and Paul James 64
Arachnids. Jan Beccaloni 76
Wasps of Surrey. David W. Baldock 100
How to begin the study of mosses and liverworts. June Chatfield 132
A monograph of some British desmids. Alan J. Brook and David B. Williamson 133
Books and naturalists. David Elliston Allen 135
Bird migration. Ian Newton 137
Mayfly larvae (Ephemeroptera) of Britain and Ireland. J. M. Elliott and U. H. Humpesch 138
Checklist of flowering plants and ferns in the Isles of Scilly. Rosemary Parslow . 138
The flora of Herfordshire. Trevor James 139

The London Naturalist

Instructions to contributors

Submission of papers

Papers **must be submitted in duplicate** to the editor, Mr K. H. Hyatt at his home address, 1 Tremcelynog, Rhandirmwyn, Llandovery, Carmarthenshire SA20 0NU. Please contact the editor before the end of January if you wish to contribute to the forthcoming issue. However, the editor may be contacted at any time on 01550 760346 to discuss possible contributions, and will be pleased to send a recent offprint to show our style, and as a guide to preparing the manuscript, **which should be followed as closely as possible in regard to layout and typefaces.** Manuscripts **must be double spaced throughout on one side of the paper only** and with wide (3-cm) margins. **Authors must retain a copy.** Papers should include at the beginning an **abstract, summary** or **synopsis. Sheets must be numbered.** Papers are peer-reviewed as appropriate. **After acceptance**, the editor would be pleased to receive contributions as Microsoft Word-compatible files (or they can be e-mailed to the printer) **together with two matching hard copies of the final text.** Papers should be relevant to the natural history and archaeology of the London Area. This includes comparisons between London and its surrounding countryside with other localities, as well as work relating to or comparing species or habitats which occur in the London Area. Contributions of relevance nationally will also be considered.

Text

Locality spellings should follow the latest editions of maps published by the Ordnance Survey. Capitalization should be kept to a minimum. Common names of animals and plants must begin with lower-case initials (except for proper nouns), and **only** Latin names of genera and species must be underlined unless typed in italic. When both common and Latin names are given there should be no brackets or commas separating them. **Genus names should appear in full where first used within each paragraph.** When scientific names are taken from a standard work, which must be cited, authorities may be omitted. In descriptive matter numbers up to a hundred should be in words, except in a strictly numerical context. Dates should follow the logical sequence of day, month, year, i.e., 25 December 1971, but in lists may be as 25.xii.1971. Measurements should be in metric and follow the SI system (Système International d'Unités), with imperial equivalents in parentheses where appropriate. There should be no full point following Dr, Mr, Mrs, or St. Lists should be in systematic, alphabetic or numerical order. **Hyphens should not appear at the ends of lines** as the right-hand margins of manuscripts do not need to be justified: **turn off the hyphenation option. Tables and figure legends should be typed on separate sheets at the end of the text. Word-processed text should not use italic, bold or compressed typeface. Paragraphs should be indented. Sentences must not begin with numerals. Footnotes and endnotes should be avoided.**

References

Reference citation should follow the examples given below. Capitalization in titles of books and papers in journals should be kept to a minimum. Journal titles should be in full, or follow the abbreviations in the *World list of scientific periodicals,* and be underlined or in italics. Book titles should also be underlined or in italics. Examples are as follows:

In text:

Meadows (1970: 80) or (Meadows 1970).

In references:

MEADOWS, B. S. 1970. Observations on the return of fishes to a polluted tributary of the River Thames 1964–9. *Lond. Nat.* **49:** 76–81.

MELLANBY, K. 1970. *Pesticides and pollution.* Ed.2. Collins, London.

WHITE, K. G. 1959. Dimsdale Hall moat, part II. *Trans. a. Rep. N. Staffs. Fld Club* **92:** 39–45.

Authors must ensure that all references are cited accurately: they will not be checked by the editor.

Illustrations

Distribution maps should be submitted in the form of a recording map with symbols in Indian ink and stencilled or by transfers. Solid dots are used to indicate contemporary or recent presence, circles for old records, and crosses (not pluses) for other information, such as introduced species. The caption should be written outside the frame of the map and will be set up by the printer. Scale bars must be included **within** the frame of the map.

Line drawings should be in Indian ink on white card or tracing paper, larger than the printed size, but no larger than A4. Place names, etc., must be produced with stencils or with sharp typing. Captions should be separate as they will be set up by the printer, but keys that include special characters should be included **within** the border of the figure.

Photographs should be glossy black-and-white prints, of good contrast, preferably plate or half-plate in size, or, following consultation with the editor, in the form of colour transparencies, either 35 mm or larger. Colour prints are also suitable for reproduction in the text in black and white.

Computer-generated illustrations must be sharply defined and preferably be supplied digitally.

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Proofs will be sent to authors for scrutiny, but only essential corrections can be made at that stage.

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No. 89

The London Naturalist

2010

Species-rich grassland on the Central Line, London Underground *Frontispiece*

Officers for 2010 3

The Society's Recorders 4

Report of the Society for the year ending 30 June 2009 6–10

Official and sectional reports for 2009 11–18

Edgington, John — The fern flora of inner London 19–29

Swindells, John — London Natural History Society's 150th Anniversary Walk: London Fields to The Barbican, Tuesday 17 June 2008 31–35

Jackman, Suzie — Wildlife and habitats over ground on the London Underground 37–46

McLauchlin, Jane — Monitoring the recolonization of cleared ground at Oxted Downs, Surrey 47–58

Edgington, John — Bur chervil reappears in Green Park 59

Milner, J. Edward — Spider records in 2008 and 2009 for the London Area; and concern about a misleading article in the national press . . 61–63

Williams, L. R. — London butterfly monitoring report for 2009 65–75

Anderson, Neil — Odonata report for 2009 77–78

Survey of Bookham Common: sixty-eighth year Progress report for 2009 79–92

Milner, J. Edward — Orb-web spiders on the Ladies Bathing Pool Meadow and elsewhere on Hampstead Heath 93–99

Duckett, Jeffrey G. and Pressel, Silvia — London's changing bryophyte flora 101–116

Spencer, Mark — Botany report for 2008 and 2009 117–131

Book reviews index 141

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